

United States Army Corps of Engineers
New England District

2022 Annual Operations, Maintenance, and Monitoring Report

Main Post

**Former Fort Devens Army Installation
Devens, Massachusetts**

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2022 Annual Operations, Maintenance, and Monitoring Report

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Former Fort Devens Army Installation
Devens, Massachusetts

August 2023

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CERTIFICATION

I hereby certify that the enclosed Report, shown and marked in this submittal, is that proposed to be incorporated with Contract Number W912WJ-19-D-0014. This document was prepared in accordance with the United States Army Corps of Engineers (USACE) Scope of Work and is hereby submitted for Government approval.

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Acronyms and Abbreviations

µg/L	microgram per liter
AAFES	Army Air Force Exchange Service
AOC	area of contamination
Army	United States Army
BRAC	Base Realignment and Closure
BTEX	benzene, toluene, ethylbenzene, and xylenes
CCV	continuing calibration verification
CFS	Commonwealth Fusion Systems
CG	cleanup goal
COC	contaminant of concern
COD	chemical oxygen demand
CSM	conceptual site model
DCB	dichlorobenzene
DCL	Fort Devens Consolidation Landfill
DO	dissolved oxygen
DoD	Department of Defense
ELAP	Environmental Laboratory Accreditation Program
EPH	extractable petroleum hydrocarbon
ESMA	Excavated Soils Management Area
Eurofins	Eurofins TestAmerica Laboratories, Inc.
Fort Devens	former Fort Devens Army Installation
FS	feasibility study
ft/ft	foot per foot
HA	Housing Area
Harding	Harding Environmental Science & Engineering, Inc.
HGL	HydroGeoLogic, Inc.
HLA	Harding Lawson Associates, Inc.
Horne	Horne Engineering Services, Inc.
J	estimated concentration
KGS	KOMAN Government Solutions, LLC
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LTM	long-term monitoring
LTM Plan	Long-Term Monitoring Plan

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LTMMMP	Long-Term Monitoring and Maintenance Plan
LTM Report	2022 Annual Long-Term Monitoring Report
LUC	land-use control
LUCIP	Land-Use Control Implementation Plan
LUCIP Addendum	Land-Use Control Implementation Plan Addendum
MassDEP	Massachusetts Department of Environmental Protection
MassDevelopment	Massachusetts Development and Finance Agency
MCL	maximum contaminant level
MEC	munitions and explosives of concern
mg/L	milligram per liter
mm	millimeter
MNA	monitored natural attenuation
MPE	measuring point elevation
MS	matrix spike
MSD	matrix spike duplicate
mV	millivolt
NAUL	Notice of Activity and Use Limitation
NAVD88	North American Vertical Datum of 1988
ORP	oxidation-reduction potential
RTN	Release Tracking Number
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
QAPP	Quality Assurance Project Plan for the Annual Long-Term Monitoring and Maintenance Program
QC	quality control
RI	remedial investigation
ROD	Record of Decision
SA	Study Area
S-A JV	SERES-Arcadis 8(a) Joint Venture 2, LLC
SVOC	semivolatile organic compound
TDS	total dissolved solids
UJ/J	estimated
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
UST	underground storage tank
UXO	unexploded ordnance

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VOC	volatile organic compound
VPH	volatile petroleum hydrocarbons
Weston	Weston Solutions, Inc.
yd ³	cubic yard

1 Introduction

This 2022 Annual Long-Term Monitoring Report (LTM Report) details the performance of ongoing long-term monitoring (LTM) activities at the former Fort Devens Army Installation (Fort Devens) Main Post, located in Devens, Massachusetts (Figure 1). LTM activities were performed in accordance with the Long-Term Monitoring and Maintenance Plan (LTMMP; Sovereign/HydroGeoLogic, Inc. [HGL] 2015) and the Quality Assurance Project Plan for the Annual Long-Term Monitoring and Maintenance Program (QAPP; SERES-Arcadis 8(a) Joint Venture 2, LLC [S-A JV] 2020. S-A JV prepared this LTM Report on behalf of the United States Army Corps of Engineers (USACE) – New England District, under Contract Number W912WJ-19-D-0014.

1.1 Long-Term Monitoring Program Background

The LTM program instituted at Fort Devens is a result of the individual Records of Decision (RODs) issued for each area of contamination (AOC) discussed in this LTM Report. These AOCs consist of:

- AOC 57: Building 3713 Fuel Oil Spill:
 - 2001 ROD by Harding Environmental Science & Engineering, Inc. (Harding [2001])
- AOC 69W: Fort Devens Elementary School (Building 215) Fuel Oil Spill Site:
 - 1999 ROD by Harding Lawson Associates, Inc. (HLA [1999a])
- AOC 43G: Historical Gas Station G:
 - 1996 ROD by United States Environmental Protection Agency (USEPA [1996])
- AOCs 32 and 43A: Defense Reutilization and Marketing Office Yard and former Petroleum, Oils, and Lubricants Storage Area:
 - 1998 ROD by Horne Engineering Services, Inc. (Horne [1998])
- The Fort Devens Consolidation Landfill (DCL):
 - 1999 ROD by HLA (HLA 1999b)
- Grant Housing Area (HA) and 37-millimeter (mm) Impact Area:
 - 2009 ROD by Weston Solutions, Inc. (Weston [2009])

The RODs established site-specific remedial actions for each AOC, as well as the LTM program and land-use controls (LUCs). The effectiveness of the remedial actions is reviewed periodically in Five-Year Review Reports (HLA 2000; Nobis Engineering, Inc. 2005; HGL 2010; H&S Environmental, Inc. 2015; KOMAN Government Solutions, LLC [KGS] 2021).

LTM activities in 2022 were conducted at each of the above AOCs in accordance with the LTMMP (Sovereign/HGL 2015) and included the following:

- AOC 57. Annual water level measurements at 19 locations at Areas 2 and 3, and groundwater sampling at Area 3, were conducted during the spring LTM event. Groundwater samples were analyzed for total metals (arsenic, iron, and manganese) at two Area 3 monitoring wells. One surface water location was also sampled during the spring 2022 LTM event and the samples were analyzed for dissolved metals (arsenic, iron, and manganese).
- AOC 69W. Annual water level measurements at 17 locations and groundwater sampling at eight monitoring wells and two well points were conducted during the fall LTM event. Samples from eight wells were analyzed for extractable petroleum hydrocarbons (EPHs) and target analyte polycyclic aromatic hydrocarbons (PAHs).

Samples from each of the 8 monitoring wells and two well points were analyzed for dissolved metals (arsenic, iron, and/or manganese).

- *AOC 43G*. Annual water level measurements at 11 monitoring wells and groundwater sampling at five wells were conducted during the fall LTM event. Groundwater samples were analyzed for volatile petroleum hydrocarbons (VPHs); including target analytes: benzene, toluene, ethylbenzene, and xylenes (BTEX) and naphthalene; alkalinity; and total metals (iron and/or manganese).
- *AOC 32/43A*. Annual water level measurements at 25 locations and groundwater sampling at four monitoring wells were conducted during the spring LTM event. One well location was observed to be dry (well 32M-01-11XBR). Groundwater samples were analyzed for volatile organic compounds (VOCs), VPHs including target analytes BTEX/naphthalene, and total metals (arsenic and manganese).
- *DCL*. Annual landfill gas vent monitoring, monthly operation and maintenance of the leachate pump station, annual sampling of the leachate, and an annual landfill cap inspection were conducted. The DCL leachate sampling consists of collecting one sample and analyzing the sample for VOCs, semivolatile organic compounds (SVOCs), pesticides/polychlorinated biphenyls (PCBs), total petroleum hydrocarbons, total metals (select list), total suspended solids, pH, total phenolics, and total cyanide. Semiannual water level measurements at seven locations, and semiannual groundwater sampling at four locations were conducted during the spring and fall LTM events. Groundwater samples were analyzed for VPHs including target analytes BTEX/naphthalene, EPHs including target PAHs, pesticides, total metals (select list), total dissolved solids (TDS), anions (chloride and sulfate), nitrate and nitrite, alkalinity, total cyanide, and chemical oxygen demand (COD).
- *Grant HA and 37 mm Impact Area*. Annual screening for unexploded ordnance (UXO) in the 37 mm Impact Area, performed by sweeping 10% of the site with a metal detector.

In addition to the above activities, annual LUC inspections and interviews were conducted at each of the above AOCs. LUC inspections and interviews were also conducted at the former Oak and Maple HAs, as discussed in Section 7.2.

1.2 Site Description and History

The former Fort Devens Army Installation is located in the towns of Ayer and Shirley in Middlesex County, and Harvard and Lancaster in Worcester County, Massachusetts, approximately 35 miles northwest of Boston, Massachusetts. The installation occupied approximately 9,260 acres and was composed of the North, Main, and South Posts (Figure 1). Route 2 divides the South Post from the Main and North Posts. The Nashua River runs through the North, Main, and South Posts. The area surrounding Fort Devens is largely residential.

The area around Fort Devens was occupied by residential homes and farmland until 1917, when Camp Devens was established as a temporary training area for soldiers during World War I and was used for a variety of training missions until 1990. In 1932, the site was named Fort Devens and made a permanent installation with the primary mission of commanding, training, and providing logistical support for non-divisional troop units. The installation also supported the United States Army (Army) Readiness Regional and National Guard units in the New England area. Pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act of 1986, Fort Devens was placed on the National Priorities List on November 21, 1989, because of identified environmental contamination at several sites.

Devens was identified for cessation of operations and closure under Public Law 101-510, the Defense Base Realignment and Closure (BRAC) Act of 1990, and officially closed in March 1996. As part of the Fort Devens BRAC program, portions of the property formerly occupied by Fort Devens were retained by the Army for reserve forces training and renamed the Devens Reserve Forces Training Area. Areas not retained as part of the Devens Reserve Forces Training Area have been either transferred or are in the process of being transferred to the Massachusetts Development and Finance Agency (MassDevelopment) for reuse and redevelopment, and to other federal agencies as noted below.

1.3 Groundwater Hydrology

Depth to groundwater was measured prior to sampling all wells at the AOCs within a 24-hour period. Plotting the synoptic groundwater elevation data allows for determination of groundwater flow direction and gradient, essential in understanding contaminant migration and evaluating the effectiveness of the monitoring well network. Groundwater and surface water elevations for the spring and fall 2022 LTM events are presented in Tables 1 and 2, respectively. The 2022 groundwater gradients are expressed in feet per foot (ft/ft) and AOC-specific groundwater elevation data are presented in sections specific to each AOC.

Annual precipitation data for 2004 through 2022, as reported from the Fitchburg Municipal Airport weather station, are presented in Table 3. The data indicate that precipitation across the area in March, May, June, July, and August 2022 was less than average for the period of record; January, April, October, and November 2022 were near average (within one-half inch) for the period of record; and February, September, and December 2022 were greater than average for the period of record. The overall precipitation in 2022 (39.61 inches) was lower than the average of 43.07 inches for the period of record.

1.4 2022 Long-Term Monitoring Activities

1.4.1 Groundwater Sampling

Sampling activities were coordinated with the USACE – New England District, BRAC Environmental Coordinator office, contracted analytical laboratory, and stakeholders for each respective site. The laboratory provided sampling supplies (sample containers, packing material, custody seals, and coolers) to the sampling team per the specific sample requirements presented in Table 4. Sampling equipment consisted of water quality meters, turbidity meters, bladder pumps, peristaltic pumps, and water levels meters that were tested before use. Well construction details (Table 5) were maintained on site during the sampling events to confirm well screen interval information as needed. The condition of the monitoring well network at each LTM site was inspected during the 2022 sampling events. Observations, if noted, are contained within the field sampling logs provided in Appendix A. Monitoring wells were found to be in good overall condition, and well locks were replaced if needed.

Monitoring wells were purged and sampled in accordance with Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells (USEPA 2017b). Low-flow bladder or peristaltic pumps were used, as described in the LTMMP (Sovereign/HGL 2015). Samples submitted for dissolved metals analyses were field filtered through 0.45-micron filters directly into preserved sample bottles.

Nondedicated sampling and monitoring equipment was decontaminated in accordance with the QAPP (S-A JV 2020). Field duplicate samples were collected during sampling events at each AOC, at the rate of 10% (i.e., one per 10 samples), to evaluate field precision. Matrix spike (MS)/matrix spike duplicate (MSD) pairs (one set per AOC) were also submitted to evaluate matrix effects on field and analytical precision and accuracy.

The field instruments used to measure water quality parameters (temperature, dissolved oxygen [DO], pH, oxidation-reduction potential [ORP], specific conductance, and turbidity) were calibrated twice daily (before and after field use) in accordance with the manufacturer's instructions and the Calibration of Field Instruments Standard Operating Procedure (USEPA 2017a). Equipment calibration log forms are provided in Appendix A. No instrument error was noted during the spring or fall LTM events.

Investigation-derived waste was not generated during the 2022 LTM activities. Purge water from wells was returned to the ground near sample collection locations in accordance with the LTMMP (Sovereign/HGL 2015).

1.4.2 Laboratory Testing

Eurofins TestAmerica Laboratories, Inc. (Eurofins) was the primary contract laboratory for the analysis of water samples for the spring and fall 2022 LTM events. Eurofins is compliant with the Quality Systems Manual for Environmental Laboratories, Version 5.3 (Department of Defense [DoD] 2019) under the DoD Environmental Laboratory Accreditation Program (ELAP) and holds current accreditation in accordance with the National ELAP for all applicable analytical methods.

Eurofins subcontracted all VPH/EPH samples to Katahdin Analytical Services, located in Westbrook, Maine, which were analyzed using the Massachusetts Department of Environmental Protection (MassDEP) analytical methods. Katahdin Analytical Services holds the MassDEP certification and DoD ELAP accreditation for these analyses.

Laboratory analytical results for water samples collected during the 2022 LTM events are discussed in Sections 2 through 6. Laboratory analytical reports are provided in Appendix B.

1.4.3 Data Validation

Quality assurance and quality control (QC) samples were collected and analyzed during the spring and fall 2022 groundwater sampling events to evaluate sample collection, transportation, and analysis procedures. Field duplicate samples were collected from monitoring wells 57M-96-11X (AOC 57, spring 2022), ZVM-99-22X (AOC 69W, fall 2022), XGM-97-12X (AOC 43G, fall 2022), 32M-01-18XBR (AOC 32/43A, spring 2022), and LFM-99-05A (DCL, spring and fall 2022).

Data validation was completed on all laboratory deliverables by Laboratory Data Consultants, Inc., located in Carlsbad, California. Analytical results from the 2022 LTM events were evaluated for data acceptability in accordance with the Environmental Data Review Program Guidance (USEPA 2018), the Quality Systems Manual for Environmental Laboratories, Version 5.3 (DoD 2019), and the laboratory's defined acceptance limits. The method requirements for the USEPA SW-846 QC guidance and the MassDEP VPH and EPH methods were also used as supplemental information. The data validation reports are provided in Appendix C; a summary of quality control exceedances noted during data validation is also included in Appendix C.

Laboratory Data Consultants, Inc. reviewed and updated the database with appropriate data qualifiers as needed. Laboratory analyses were confirmed to have been performed in general compliance with the precision, accuracy, representativeness, completeness, comparability, and sensitivity requirements listed in the QAPP (S-A JV 2020). Sample results that were qualified as estimated (UJ/J) due to quality control exceedances are usable with caution. The EPH results for all analytes (C11-C22 Aromatics, C19-C36 Aliphatics, C9-C18 Aliphatics, and PAHs) in field duplicate sample DCL-DUP01-SPR22 (DCL, Spring 2022) were qualified as rejected (R) and are not usable due to surrogate compound (5-alpha-androstane) recovery less than 10%. The acid fraction analytes reported in the SVOC analysis of sample DCL LEACHATE-FAL22 (DCL, fall 2022) were qualified as rejected (R) and are not

usable due to surrogate compound (phenol-d5) recovery less than 10%. With the exception of the EPH results in sample DCL-DUP01-SPR22 and acid fraction SVOC results in sample DCL LEACHATE-FAL22, analytical results reported for the 2022 LTM samples were deemed valid and usable for intended purposes, and the overall data usability for DCL monitoring wells and the DCL leachate sample was not affected. EPH and SVOCs have not been detected historically at DCL.

1.4.4 Data Evaluation

The analytical results for each AOC were compared to the respective monitoring criteria or cleanup goals (CGs) established in the applicable ROD. Arsenic results in groundwater were compared to the 10 microgram per liter ($\mu\text{g/L}$) maximum contaminant level (MCL) that was promulgated in 2006, which is lower than the cleanup standard that was previously established in the site-specific RODs. Results are discussed in the AOC-specific sections that follow. Table 6 presents the site-specific contaminants of concern (COCs) and the associated CGs or comparison criteria for each AOC. Table 7 presents the DCL leachate discharge limits set by MassDevelopment in accordance with the Industrial Discharge Permit.

2 Area of Contamination 57

2.1 Site Background

AOC 57 is located between Barnum Road and Cold Spring Brook on the northeast side of what was formerly the Main Post of Fort Devens in Harvard, Massachusetts (Figure 1). AOC 57 is located within a Zone II aquifer protection area for the Town of Ayer Grove Pond public water supply wells. The area that includes AOC 57 was used primarily for storage and maintenance of military vehicles. AOC 57 consists of three subareas (Areas 1, 2, and 3) located south to southeast of Building 3713 and former Buildings 3756, 3757, and 3758 (Figure 2). Each subarea includes an upland area that slopes downward to a delineated wetland area bordering Cold Spring Brook. The subareas received stormwater runoff and waste from vehicle maintenance at former vehicle storage yards related to former Buildings 3713, 3757, and 3758.

A No Further Action ROD was completed for Area 1 (Harding 2001) following the removal of PAH-contaminated soil in 1997. The associated investigation revealed contaminated groundwater, soil, and sediment in Area 2. The Army completed a limited soil removal action at Area 2 in 1994, and it was discovered that contamination extended beyond the limits originally estimated. Approximately 1,300 cubic yards (yd³) of soil were removed, and the site was transferred to the remedial investigation (RI)/feasibility study (FS) process. During spring 1999, a soil removal action focusing on PCBs and EPH in soil was performed at Area 3 based on data obtained from the RI.

Areas 2 and 3 are shown on Figures 3 and 4, respectively. In June 2000, the Army completed an RI at AOC 57 Areas 2 and 3 that revealed the presence of residual contamination at both sites. A ROD for Areas 2 and 3 was issued in September 2001 and selected excavation (for possible future use) and LUCs for Area 2, and excavation (to accelerate groundwater cleanup) and LUCs for Area 3. The excavations and product recovery activities are discussed in the Interim Removal Action Completion Report – AOC 57 (Conti Environmental, Inc. 2004). The data collected during the RI activities prompted an Explanation of Significant Differences in March 2004 to add EPH as a COC for Area 2.

Construction of a solar panel manufacturing facility between Areas 2 and 3 and Barnum Road (112 Barnum Road; Figure 2) was completed in 2009. The current occupant (Jabil, Inc.) produces healthcare products.

An active irrigation well is located adjacent to the building at 78 Barnum Road (Figure 2). The well is 505 feet deep and is believed to be an open borehole bedrock well. The property manager has indicated that the well is used for lawn care for the property from spring to fall and there is no flow meter to record the daily flow rate or volume of water used.

In March 2019, multiple debris areas were identified at AOC 57 between Areas 2 and 3, southeast of the walking path located behind 112 Barnum Road (Figure 2). Debris included rusted vehicle parts (metal debris, tires, and bumpers) and other smaller piles of rusted scrap metal (empty drums and containers). Large concrete slabs were also found. In November and December 2021, debris was removed from AOC 57 in accordance with the Debris Removal Workplan (S-A JV 2021); additional information is presented in the Draft Debris Removal Activities Summary Report submitted to the USEPA in January 2022 (S-A JV 2022a).

2.2 Groundwater Hydrology

During spring 2022 LTM, water levels were collected at a total of 19 wells and piezometers prior to groundwater sampling, as presented in Table 1. A groundwater elevation contour map is shown on Figure 5 (Areas 2 and 3).

Data indicate that shallow groundwater flows toward Cold Spring Brook to the south/southeast, consistent with historical groundwater flow observations.

The groundwater hydraulic gradients for shallow groundwater within Areas 2 and 3 in spring 2022 were approximately 0.01 ft/ft (between upgradient well 57M-03-01X and downgradient well 57M-03-03X) and 0.027 ft/ft (between upgradient well 57M-95-03X and downgradient well 57M-96-11X), respectively (Figure 5). The calculated hydraulic gradients and depicted flow directions are consistent with those for previous years.

2.3 Groundwater and Surface Water Sampling

Groundwater and surface water in Area 3 was sampled historically on a semiannual basis from 2003 to 2007, and on an annual basis in the spring since 2008. The sampling program was modified in the LTMMP (Sovereign/HGL 2015) during 2015 to suspend sampling at Area 2; the LTMMP was finalized in accordance with provisions of the 1991 Devens FFA Section 7.8 and released without USEPA comment. Groundwater at AOC 57 is sampled annually in the spring. The spring 2022 LTM event consisted of collecting groundwater samples from two Area 3 monitoring wells (57M-95-03X and 57M-96-11X). Groundwater samples were analyzed for total metals (arsenic, iron, and manganese). One surface water location was also sampled during the spring 2022 LTM event (57-SW1) and was analyzed for dissolved metals (arsenic, iron, and manganese). The spring 2022 groundwater and surface water analytical results for Area 3 are presented in Tables 8 and 9, respectively.

2.3.1 Spring 2022 Data Summary

Exhibit 2-1, below, summarizes the analytes detected in groundwater samples collected from AOC 57 in spring 2022 that exceeded the CG specified in the ROD (Harding 2001). Appendix D provides the data for 2003 through 2022, and Appendix E provides the Mann-Kendall trend analyses.

Exhibit 2-1 AOC 57 Area 3 Contaminant of Concern CG Exceedances, Spring 2022

Well Identification	Analyte	Groundwater CG (µg/L) ¹	Detected Result (µg/L)
57M-95-03X	Arsenic (total)	10	26
57M-96-11X	Arsenic (total)	10	280

Notes:

¹ The CG for arsenic in groundwater is the MCL standard.

J = estimated concentration

Total arsenic concentrations in well 57M-95-03X have been relatively stable, at or less than 60 µg/L with an average of 32 µg/L since the fall 2004 event. Total arsenic concentrations in well 57M-96-11X have varied more broadly through time, fluctuating between 100 and 470 µg/L from 2004 through 2022 (average of 202 µg/L). Although the concentrations of arsenic in well 57M-96-11X were greater than the historical average in 2020, 2021, and 2022, there is not a statistically significant trend for arsenic at this location.

One surface water sample was collected from location 57-SW1; the dissolved iron concentration (1,900 µg/L) exceeded the surface water benchmark. This is consistent with historical results, which have ranged from 240 to 21,000 µg/L historically and show variability from year to year.

Results of additional analytes screened against groundwater monitoring criteria and surface water benchmarks are presented in Tables 8 and 9, respectively. Figure 6 shows exceedances of the groundwater CG and surface

water results compared to the surface water benchmarks for analyses required per the LTMMMP (Sovereign/HGL 2015).

2.3.2 Water Quality Parameters

General water quality chemistry parameters (pH, temperature, specific conductivity, ORP, DO, and turbidity) were measured at each well while sampling and were used to determine groundwater stabilization prior to sampling. Final readings prior to collection of each sample are presented in Table 8.

ORP and DO data can be used to determine whether reducing or oxidizing conditions are present in groundwater. Low ORP values (less than 50 millivolts [mV]) and DO concentrations less than 1 milligram per liter (mg/L) are generally associated with reducing conditions. Reducing conditions are a typical byproduct of the biodegradation of fuel products and may result in solubilizing of naturally occurring arsenic (and other oxidation-reduction-sensitive metals such as iron and manganese) from native soils to groundwater. This results in elevated concentrations of these compounds in groundwater at some locations, while some subsurface zones contain naturally occurring concentrations which are greater than their respective CGs. DO and ORP at well 57M-96-11X (ORP of 9.5 mV and DO of 0.32 mg/L), well 57M-95-03X (ORP of -61.3 mV and DO of 0.58 mg/L), and surface water sampling location 57-SW-1 conditions (ORP of 162.2 mV and DO of 0.49 mg/L) indicate that groundwater in these wells is generally reducing or moderately reducing. These locations are hydraulically downgradient of the Area 3 source area.

2.4 Land-Use Controls, Interviews, and Inspection

AOC 57 is owned by the Army but is leased to MassDevelopment per a Lease in Furtherance of Conveyance agreement. Under the Lease in Furtherance of Conveyance agreement, MassDevelopment must comply with the LUCs of the ROD (Harding 2001) to limit the potential exposure to the residual contaminated soil and groundwater under both existing and future site conditions. The LUCs ensure that exposure to any remaining contaminated soils beneath the site is controlled and prohibit groundwater extraction for industrial or potable water supply use. The site-specific annual LUC checklist, including physical on-site inspection and interview components, was developed in 2007 for use during LUC verification activities to ensure control requirements are being met. Appendix F contains the completed checklist.

An annual in-depth LUC inspection was completed on December 14, 2022, which confirmed the following (Appendix F):

- No signs of increased exposure potential to the public from soil and/or surface water contaminants.
- Minor damage observed to on-site monitoring wells. A new standpipe was installed on one monitoring well (57M-96-12X) in May 2022.
- No evidence that groundwater extraction wells are present.
- No evidence of site use changes or increased exposure potential.

The S-A JV conducted an interview on January 27, 2023, with Neil Angus (Devens Enterprise Commission), Anne-Marie Dowd (MassDevelopment), and Meg Delorier (MassDevelopment) which confirmed the following (Appendix F):

- The interviewees are familiar with the LUCs imposed on the property and documentation of these controls.
- No groundwater extraction wells are present.

- No proposed plans for property sale, future redevelopment and construction, or demolition activities at the site.
- No issues with site access for monitoring.

2.5 Conclusions

After removal of the source area in soil, natural attenuation processes have effectively reduced the remaining concentrations of site COCs (tetrachloroethene, cadmium, 1,4 dichlorobenzene, PCBs, and EPH C11-C22 aromatic carbon range) to less than their respective remediation goals (Sovereign/HGL 2015).

The 2022 LTM results at AOC 57 are consistent with the conceptual site model (CSM; HGL 2008). Total arsenic was detected at concentrations greater than the CG in wells 57M-95-03X and 57M-96-11X, which is consistent with historical observations. Although the concentrations of arsenic in well 57M-96-11X in 2020, 2021, and 2022 are greater than the historical average, there is not a statistically significant trend for arsenic at this location. Groundwater at AOC 57 flows towards Cold Spring Brook; surface water samples collected from location 57-SW-1, adjacent to Area 3, have not identified arsenic concentrations at levels greater than the USEPA Water Quality Criterion (monitoring benchmark) of 150 µg/L since long-term monitoring started in 2003. Dissolved iron concentrations at 57-SW-1 have exceeded the monitoring benchmark of 1,000 µg/L in 15 of 19 sampling events completed since 2006, including the spring 2022 LTM event.

The remedial action selected in the ROD included the implementation of LUCs to limit potential exposure to contaminated soil and groundwater under both existing and future site use (Harding 2001). The 2022 LUC inspections and interviews indicate that the LUCs continue to be in place and in effect.

3 Area of Contamination 69W

3.1 Site Background

AOC 69W is located by the northeast corner of the intersection of Jackson Road and Antietam Street on the northern portion of what was formerly the Main Post at Fort Devens (Figure 1), within the Zone II area associated with the MacPherson Well (Figure 7). It is currently being used for the Francis W. Parker Charter Essential School (former Devens Elementary School [Building 215]), its associated parking lot, and the adjacent lawn extending approximately 300 feet northwest to Willow Brook (Figure 7).

Historical impacts at AOC 69W are attributed to two separate releases of No. 2 heating oil in 1972 and 1978. The 1972 release occurred during the installation of a new 10,000-gallon underground storage tank (UST). The 1978 release resulted from a failed piping joint in the oil pipes that led to the old boiler. Actions, including installation of an oil recovery system, were performed to recover released fuel and oily water from each release (HLA 1999a). A removal action was performed in 1998 for soils and to remove the oil recovery system. The soil removal action was limited by the presence of the building.

The ROD (HLA 1999a) issued for AOC 69W in June 1999 selected limited action as the remedy for subsurface soils and groundwater, and included LTM, LUCs, and five-year reviews. LTM was developed to monitor for off-site migration of contaminants and verify that concentrations decreased through time. The ROD (HLA 1999a) listed arsenic and VPH/EPH to be analyzed. Sampling for VPH was discontinued in 2014; concentrations were less than criteria from 2009 through 2013. Well point 69WP-13-01 was installed in 2013 to monitor for potential migration of manganese based on manganese detected at 69WP-08-01 in 2008.

3.2 Groundwater Hydrology

During the fall 2022 LTM event, water levels were collected from a total of 17 wells and piezometers (Table 2). A water table elevation contour map is shown on Figure 8. Data from the fall 2022 LTM event indicates that groundwater flows in a north-northwest direction, and a groundwater gradient of 0.006 ft/ft was calculated between upgradient monitoring well ZWM-95-17X and downgradient well ZWM-95-18X (Figure 8). The hydraulic gradients and depicted flow directions are generally consistent with those for previous years.

3.3 Groundwater Sampling

Groundwater at AOC 69W is sampled annually in the fall. The fall 2022 LTM event consisted of collecting groundwater samples from eight monitoring wells and two well points (Table 10). In accordance with the LTMMP (Sovereign/ HGL 2015), the groundwater samples were analyzed for EPH and associated target analyte list PAHs, and/or dissolved metals (arsenic, iron, and/or manganese).

3.3.1 Fall 2022 Data Summary

Exhibit 3-1, below, summarizes the analytes detected in groundwater samples collected from AOC 69W in fall 2022 that exceed the CG specified in the ROD (HLA 1999a). Results of additional analytes screened against monitoring criteria are presented in Table 10. As shown in Table 10, neither EPH or PAHs were detected in the fall 2022 groundwater samples collected at AOC 69W. Figure 9 shows exceedances of the CG and monitoring criteria for analyses required per the LTMMP (Sovereign/HGL 2015). Historical data at AOC 69W from 2000 through 2022 are provided in Appendix D. Mann-Kendall trend analyses are provided in Appendix E.

Exhibit 3-1 AOC 69W Contaminant of Concern CG Exceedances, Fall 2022

Well Identification	Analyte	Groundwater CG (µg/L) ¹	Detected Result (µg/L)
69W-94-13	Arsenic (dissolved)	10	15
ZWM-99-22X	Arsenic (dissolved)	10	170

Note:

¹ The CG for arsenic in groundwater is the MCL standard.

Each of the above dissolved arsenic detections greater than the CG are consistent with historical observations. Out of the four wells (69W-94-13, ZWM-95-15X, ZWM-99-22X, and ZWM-99-23X) evaluated using Mann-Kendall analysis only well ZWM-99-22X exhibits a statistically significant decreasing trend for dissolved arsenic.

3.3.2 Water Quality Parameters

Table 10 presents the readings for final field measured general water quality chemistry parameters (pH, temperatures, specific conductivity, ORP, DO, and turbidity) taken before collection of each groundwater sample. At AOC 69W, as described in Section 2.3.2 for AOC 57, low DO and ORP, indicating reducing conditions in groundwater, generally correlate with increased detected concentrations of metals. Monitoring well ZWM-99-22X, for example, had relatively low ORP and DO concentrations (-74.9 mV and 1.38 mg/L, respectively) and the highest concentration of arsenic detected (170 µg/L) in fall 2022.

3.3.3 Land-Use Controls, Interviews, and Inspection

Ownership of AOC 69W was transferred from the Army to MassDevelopment in August 2007. MassDevelopment later transferred ownership of AOC 69W to the Francis W. Parker Charter Essential School, the current owner. LUCs were implemented to limit potential exposure to contaminated soil and groundwater under existing and future site conditions, per the ROD (HLA 1999a) and a subsequent deed (Army and MassDevelopment 2007). LUCs ensure that the remaining contaminated soils beneath and adjacent to the building are not excavated and prohibit groundwater extraction from the site for industrial or potable water supply use. Land use is evaluated as part of the five-year review process to ensure control requirements are being met. A site-specific annual LUC checklist (Appendix F), including physical on-site inspection and interview components, was developed in 2007 for use during LUC verification activities.

An annual LUC inspection was performed on December 7, 2022, which confirmed the following (Appendix F):

- No evidence (repaved cut marks or penetrations in the pavement) within the Excavated Soils Management Area (ESMA) that have not been otherwise identified and properly documented by the property owner.
- No evidence of damage to the remedy or change to the area overlying the ESMA.
- Minor damage to monitoring wells. Monitoring well ZWM-99-22X was observed to have cracked concrete around the roadbox, but the well is functional and repairs can be scheduled at a later date.
- No evidence that groundwater extraction wells are present.

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- Access to the site is sufficient for monitoring. The S-A JV completed a vegetation removal event in October 2022 to improve access to monitoring wells in the wooded area north of the ESMA; the work was coordinated with MassDevelopment and the property owner.
- No signs of increased exposure potential.

An interview was conducted on February 18, 2023 with Neil Angus (Devens Enterprise Commission), Anne-Marie Dowd (MassDevelopment), and Meg Delorier (MassDevelopment). In addition, Michelle McKenna (Business Manager of Francis W. Parker Charter Essential School) was contacted via email on January 25, 2023. The interviews confirmed the following (Appendix F):

- The interviewees are familiar with the LUCs imposed on the property and documentation of these controls.
- No groundwater extraction wells are present.
- No proposed plans for property sale, future redevelopment, and construction or demolition activities at the site.
- No excavations (planned or emergency) north of the school were conducted within the ESMA.
- No issues with site access for monitoring.

In an email to S-A JV and the USACE dated January 25, 2023, Michelle McKenna indicated that a retaining wall/sidewalk project (previously on hold) is anticipated to be completed in 2023. The property owner is currently working with a landscape architect to complete the study, survey, and plans. The property owner is also working with an environmental services company and Licensed Site Professional to develop a soil management plan and health & safety plan.

3.4 Conclusions

The 2022 LTM results are consistent with the CSM (HGL 2008). The LTM dataset indicate that arsenic concentrations have remained consistent since 2009, VPH is no longer sampled due to being less than criteria, and EPH results have been less than monitoring criteria since the fall 2019 LTM event. The detected dissolved metal concentrations fluctuate in response to oxidation-reduction conditions in the shallow groundwater.

The ROD (HLA 1999a) remedy includes LUCs to limit potential exposure to contaminated soil and groundwater under both existing and future site use. 2022 LUC inspections and interviews indicate the LUCs continue to be in place and in effect.

4 Area of Contamination 43G

4.1 Site Background

AOC 43G is in the central portion of the former Main Post of Fort Devens (Figure 1), at the southwestern corner of Pine Road and Queenstown Street, as shown on Figure 10. AOC 43G consists of the former Army Air Force Exchange Service (AAFES) gas station (Areas 2 and 3) and historical Gas Station G (Area 1) and has been the subject of RIs associated with petroleum contamination resulting from past operations. The former gas station was used as a motor pool fueling station during the World War II era. USTs identified at AOC 43G were removed.

In October 1996, the Army conducted an FS to evaluate potential remedial alternatives and signed a ROD (USEPA 1996) to document the selected remedy. The selected remedial action includes intrinsic bioremediation, groundwater and contaminant modeling, and long-term groundwater monitoring. Intrinsic bioremediation is a remedial approach that relies on natural attenuation processes to remediate contaminants in the subsurface. Components of the selected remedy include assessment, data collection, groundwater modeling, LTM, annual reporting to the USEPA and MassDEP, and performing five-year reviews.

4.2 Groundwater Hydrology

During fall 2022 LTM, water level measurements were performed at a total of 11 wells at AOC 43G. Table 2 presents the groundwater elevations and Figure 11 shows a groundwater elevation contour map. The groundwater flow direction is to the east/southeast consistent with the local topography, eventually discharging to surface water via an unnamed tributary to Robbins Pond and to Robbins Pond itself. The calculated hydraulic gradient (0.053 ft/ft between upgradient well XGM-97-12X and downgradient well AAFES-7; Figure 11) and depicted flow direction are generally consistent with those for previous years.

4.3 Groundwater Sampling

Groundwater at AOC 43G is sampled annually in the fall. Fall 2022 LTM at AOC 43G consisted of collecting groundwater samples from five monitoring wells (Table 11). In accordance with the LTMMMP (Sovereign/HGL 2015), the groundwater samples were analyzed for VPH and target VOCs, alkalinity, and/or total metals (iron and manganese).

4.3.1 Fall 2022 Data Summary

Exhibit 4-1, below, presents the analytes detected in groundwater samples collected from AOC 43G in fall 2022 that exceed the CGs specified in the ROD (USEPA 1996). Results of additional analytes screened against monitoring criteria are presented in Table 11. Figure 12 shows exceedances of the CGs and monitoring criteria for analyses required per the LTMMMP (Sovereign/HGL 2015). Appendix D contains the AOC 43G historical data from 1999 through 2022, while Appendix E presents the Mann-Kendall statistical trend analyses of selected wells.

Exhibit 4-1 AOC 43G Contaminant of Concern CG Exceedances, Fall 2022

Well Identification	Analyte	Groundwater CG (µg/L) ¹	Detected Result (µg/L)
AAFES-2	Iron (total)	9,100	14,000
	Manganese (total)	375	2,600
XGM-93-02X	Manganese (total)	375	1,000
XGM-94-04X	Manganese (total)	375	5,600
XGM-97-12X	Iron (total)	9,100	16,000
	Manganese (total)	375	1,100

Note:

¹ The CG for iron is the background level. The CG for manganese is a site-specific goal established as part of the Long-Term Monitoring Plan (LTM Plan; HGL 2008).

Total manganese exceeded the 375 µg/L CG in four of five sampled wells. Concentrations were observed to be consistent with historical data. Of the wells evaluated using Mann-Kendall, three of five wells, AAFES-2, XGM-93-02X, and XGM 97-12X had statistically significant decreasing trends for total manganese. There was not a statistically significant trend at well XGM-94-04X or well AAFES-7.

Total iron exceeded the 9,100 µg/L CG in two of four sampled wells. There was a statistically significant decreasing trend in total iron concentrations at the three wells evaluated: AAFES-2, XGM-93-02X, and XGM-97-12X.

VPH (C5-C8 Aliphatics, C9-C10 Aromatics, and C9-C12 Aliphatics) exceeded the monitoring criteria in one of four sampled wells (AAFES-2). Specific information on each carbon fraction is provided below:

- There was a statistically significant decreasing trend for C5-C8 Aliphatics at three of four wells evaluated (AAFES-2, XGM-93-02X, and XGM-97-12X; there was not a statistically significant trend at well XGM-94-04X).
- There was a statistically significant decreasing trend for C9-C10 Aromatics at two of three wells evaluated (AAFES-2 and XGM-97-12X; there was not a statistically significant trend at well XGM-94-04X).
- There was not a statistically significant trend for C9-C12 Aliphatics at both wells evaluated (AAFES-2 and XGM-97-12X).

4.3.2 Water Quality Parameters

Table 11 presents the readings for final field-measured general water quality chemistry parameters (pH, temperatures, specific conductivity, ORP, DO, and turbidity) taken before collection of each groundwater sample. The ORP and DO data (Table 11) indicate reducing or moderately reducing conditions in groundwater at four of the five wells sampled (AAFES-2, XGM-93-02X, XGM-94-04X, XGM-97-12X). Exceedances of the CGs for iron and manganese are observed at each of these locations. Historical data indicate that the oxidation-reduction conditions and associated metals concentrations are variable at several locations. However, it is assumed that the natural degradation of the residual petroleum in the subsurface has changed the geochemical conditions of the

groundwater, which resulted in elevated concentrations of naturally occurring iron and manganese due to reductive dissolution processes.

4.4 Land-Use Controls, Interview, and Inspection

AOC 43G is currently under Army ownership. Per the ROD (USEPA 1996), substantive requirements of LUCs that restrict access to contaminated groundwater and soil are in place at AOC 43G. The Addendum to the Real Property Master Plan (Army 2007) included supplemental information on LUCs established under BRAC and Comprehensive Environmental Response, Compensation, and Liability Act programs that are applicable to AOC 43G. The LUCs were designed to protect the integrity and effectiveness of the remedy. Any proposed actions that affect the AOC 43G property must meet the following requirements of the ROD (USEPA 1996):

- Ensure that the property is not used for residential purposes and prohibit the use of groundwater beneath the site.
- If the Army transfers the property by lease or deed, an environmental baseline survey will be conducted to ensure that the remedy remains protective by incorporating all necessary environmental protection provisions within the Finding of Suitability to Transfer and the property transfer deed.
- Any intrusive construction work must consider that residual soil and groundwater contamination has been documented for AOC 43G, and such actions should be coordinated with the Department of Public Works and BRAC.

An annual LUC inspection was performed on December 14, 2022, which confirmed the following (Appendix F):

- No evidence of development or damage in the area of the remedy.
- Minor damage to monitoring wells. Some bollards and wooden stakes installed around monitoring wells are in need of replacement/repair; this was observed previously and well repairs will be scheduled during planned future site activities.
- No evidence that groundwater extraction wells are present.
- The access is sufficient to the site for monitoring.
- No signs of increased exposure potential.

Penelope Reddy (USACE) was contacted via email on January 25, 2023, and confirmed the following (Appendix F):

- The interviewee is familiar with the LUCs imposed on the property and documentation of these controls.
- No groundwater extraction wells are present.
- No proposed plans for property sale, future redevelopment and construction, or demolition activities at the site.
- No issues with site access for monitoring.

4.5 Conclusions

Based on the previous remedial activities performed at AOC 43G and evaluation of the available monitoring data, the 2022 monitoring results are consistent with the CSM (HGL 2008). The LTM dataset indicate that there is a general decreasing trend in total manganese and total iron concentrations at wells that exceed the CGs for these COCs. There were no exceedances of the CGs for target VOCs listed in the ROD (benzene, ethylbenzene, xylenes, and toluene) during the fall 2022 sampling event. VPH was detected in one groundwater sample

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(AAFES-2) at concentrations greater than the MCP GW-1 monitoring criteria. As shown in Appendix D, the fall 2022 VPH concentrations at this location are within the range of sampling results over the last 10 years, indicating stable conditions.

The ROD remedy includes LUCs to limit potential exposure to contaminated soil and groundwater under both existing and future site use. The 2022 LUC inspections and interviews indicate the LUCs continue to be in place and in effect.

5 Areas of Contamination 32 and 43A

5.1 Site Background

AOCs 32 and 43A are located east of Cook Street and north of Independence Drive (Figure 13). A portion of AOC 32 intersects a MassDEP 310 Code of Massachusetts Regulations 22.02 Zone II aquifer protection area associated with the five Grove Pond wells (Public Water Supply IDs 2019000-01G, 2019000-02G [inactive], 2019001-06G, 2019001-07G, and 2019001-08G).

AOC 32 (Defense Reutilization and Marketing Office Yard) was an active materials storage facility from approximately 1964 to 1995. It consisted of three fenced areas where various materials were processed and stored, as well as a former waste oil UST (UST #13). The tank was removed in 1992 and associated contaminated soils were excavated and disposed of off-site. COCs at AOC 32 include select VOCs and metals (arsenic and manganese). Monitored natural attenuation (MNA) is the selected remedy for groundwater contamination. Figure 13 shows the new warehouse at AOC 32 overlying the footprint of the former features.

AOC 43A (Petroleum, Oils, and Lubricants Storage Area) served as the central distribution point for all gasoline stations at Fort Devens during the 1940s and 1950s and was subsequently used to store fuels for various purposes. The distribution facility consisted of a main gasoline station, a pump house, four 12,000-gallon USTs, one 10,000-gallon UST, two 12,000-gallon aboveground storage tanks, and two 8,000-gallon aboveground storage tanks. Gasoline was delivered by rail car and transferred to the tanks. Site investigation indicated that low levels of xylenes and an elevated level of petroleum hydrocarbons was present in the subsurface soils. MNA was chosen as the selected remedy for groundwater and was incorporated into the ROD (Horne 1998).

A remedial action, consisting of in-situ chemical oxidation via persulfate injections, was implemented in February 2009 to augment the MNA remedy at AOC 32 near the former USTs. The remedial action targeted the remaining site COCs, including the dichlorobenzene (DCB) isomers, at well 32M-01-18XBR. The findings and conclusions for this remedial action are discussed in the AOCs 32 and 43A Persulfate Injection Letter Report (HGL 2009).

5.2 Groundwater Hydrology

During the spring 2022 LTM event, water level measurements were collected from a total of 26 monitoring wells and piezometers screened in both the overburden and bedrock aquifers. Table 1 presents the water level measurements. Groundwater elevation contour maps prepared for the overburden and bedrock aquifers in AOC 32/43A (Figures 14 and 15, respectively) show that groundwater generally flows to the south/ southwest with a component of southeasterly flow on the east side of the area, consistent with the site's historical flow patterns. The following hydraulic gradients were calculated based on spring 2022 LTM data:

- *Overburden, to the southwest.* Approximately 0.022 ft/ft between upgradient monitoring well 32Z-01-08XOB and downgradient well 43M-01-16XOB (Figure 14).
- *Overburden, to the southeast.* Approximately 0.032 ft/ft between upgradient monitoring well 32Z-01-07XOB and downgradient well 32M-01-14XOB (Figure 14).
- *Bedrock, to the south/southwest.* Approximately 0.028 ft/ft between upgradient monitoring well 32Z-01-12XBR and downgradient well 43M-01-16XBR (Figure 15).
- *Bedrock, to the southeast.* Approximately 0.048 ft/ft between upgradient monitoring well 32Z-01-06XBR and downgradient well 32M-01-14XBR (Figure 15).

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- *Bedrock, to the east.* Approximately 0.031 ft/ft between upgradient monitoring well 32M-01-15XBR and downgradient well 32M-01-17XBR (Figure 15).

The calculated hydraulic gradients and depicted flow directions are generally consistent with those for previous years.

Four sets of overburden and bedrock well pairs were assessed with respect to the presence of vertical gradients, as shown in Exhibit 5-1, below.

Exhibit 5-1 AOC 32/43A Vertical Gradients, Spring 2022

Location ¹	Depth to Water (feet below MPE)	Groundwater Elevation (feet NAVD88)	Bottom of Screen (feet NAVD88)	Top of Screen (feet NAVD88)	Mid-Point of Screen (feet NAVD88)	Mid-Point of Screen Separation (feet)	Vertical Gradient Spring 2022 ²
32M-01-14XOB	23.83	232.73	227.10	237.10	232.10	16.80	-0.096
32M-01-14XBR	21.71	234.35	210.30	220.30	215.30		
43M-01-16XOB	24.05	232.83	223.13	233.13	228.13	23.56	-0.031
43M-01-16XBR	25.63	232.87	199.57	209.57	204.57		
43M-01-17XOB	25.56	232.52	225.11	235.11	230.11	24.07	-0.006
43M-01-17XBR	25.63	232.66	201.04	211.04	206.04		
43M-01-20XOB	25.34	232.06	223.64	233.64	228.64	44.05	0.015
43M-01-20XBR	25.89	231.41	179.59	189.59	184.59		

Notes:

¹ The OB and BR designations associated with the location (i.e., well identification) denote overburden and bedrock, respectively.

² A negative vertical gradient indicates an upward vertical gradient, and a positive vertical gradient indicates a downward vertical gradient.

MPE = measuring point elevation

NAVD88 = North American Vertical Datum of 1988

Negative vertical gradients at these wells indicate there is an upward flow component at each location. Upward vertical gradients have been observed consistently at well pair 32M-01-14XOB/XBR, whereas at least one positive vertical gradient (downward flow component) has been observed over the last five spring LTM events in the remaining three well pairs. This is consistent with the site’s historical flow patterns, with the magnitude of the gradients fluctuating somewhat from event to event, possibly due to differences in precipitation (Table 3). There are no COCs in groundwater that exceed CGs at AOC 32/43A where these well pairs are located.

5.3 Groundwater Sampling

LTM activities at AOC 32/43A were conducted in spring 2022. In accordance with the LTMMP (Sovereign/ HGL 2015), four wells were sampled for VOCs, VPH and BTEX, and total metals (arsenic and manganese).

5.3.1 Spring 2022 Data Summary

Exhibit 5-2, below, presents the analytes detected in groundwater samples collected from AOC 32/43A in spring 2022 that exceeded the CGs specified in the ROD (Horne 1998). Results of additional analytes screened against monitoring criteria are presented in Table 12. Figure 16 shows exceedances of the CGs and monitoring criteria for

analyses required per the LTMMP (Sovereign/HGL 2015). Appendix D provides historical data from 2006 through 2022, while Appendix E provides the Mann-Kendall statistical trend analyses of selected wells.

Exhibit 5-2 AOC 32/43A Contaminant of Concern CG Exceedances, Spring 2022

Well Identification	Analyte	Groundwater CG (µg/L) ¹	Detected Result (µg/L)
32M-01-14XOB	Arsenic (total)	10	29
32M-01-18XBR	1,4-dichlorobenzene (1,4-DCB)	5	18

Note:

¹ The CG for arsenic and select VOCs in groundwater is the MCL; the CG for manganese in groundwater is the background level.

Arsenic has been historically detected at concentrations greater than the CG in well 32M-01-14XOB. The current arsenic concentration in well 32M-01-14XOB (29 µg/L) is greater than the CG but is less than the historical average of 52 µg/L samples collected since spring 2006. Arsenic concentrations exhibit a statistically significant decreasing trend at well 32M-01-14XOB.

Following in-situ chemical oxidation injections in 2009, concentrations of 1,2-DCB, 1,3-DCB, 1,4-DCB, and VPH (C9-C10 Aromatics) in well 32M-01-18XBR have decreased significantly. Concentrations of 1,3-DCB and 1,4-DCB and VPH (C9-C10 Aromatics) at well 32M-01-18XBR exhibit a statistically significant decreasing trend (Appendix E). Chlorobenzene at well 32M-01-18XBR exceeded the monitoring criteria in 2022, but there is not currently a statistically significant trend for chlorobenzene at this well.

5.3.2 Water Quality Parameters

General water quality chemistry parameters (pH, temperature, specific conductivity, ORP, DO, and turbidity) were measured at each of the four sampled wells concurrent with low-flow sampling and were used to verify groundwater stabilization within each well before sampling (Table 12). The ORP and DO data recorded prior to sampling (Table 12) indicate that groundwater at AOC 32/43A is generally oxidizing. Concentrations of arsenic and manganese in groundwater are expected to continue to decrease through time as they come out of solution under oxidizing conditions.

5.4 Land-Use Controls, Interviews, and Inspection

O'Reilly Automotive, Inc. currently owns and operates the property at AOC 32/43A. LUCs were established per the ROD (Horne 1998) and restricted the use of groundwater at the site, preventing both industrial and potable use of groundwater. LUCs are verified during annual sampling events in accordance with the 2015 LTMMP (HGL/Sovereign 2015). Appendix F provides a site-specific annual LUC checklist, including physical onsite inspection and interview components. An annual in-depth LUC inspection was performed on December 7, 2022, which confirmed the following:

- Minor evidence of development or damage in the area of the remedy.
 - The on-site facility manager (Rich Smith) and risk manager (Jason Grasham) from O'Reilly pointed out several pavement cut-outs in the paved parking/roadway area to the east of the O'Reilly building. SA-JV and USACE personnel were unaware of the cut-outs and did not know why they were present.

- The SA-JV followed up with O'Reilly regarding the origin of the cut-outs and received a response from Joe Mrgan at O'Reilly via email on February 20, 2023 (Mrgan 2023), that the cut-outs were from ground sampling done after a leak from a vehicle.
 - The SA-JV determined that the pavement cutouts were artifacts from soil sampling and limited soil excavation work conducted under MassDEP Release Tracking Number (RTN) 2-21677. This RTN was opened in August 2021 due to a spill of up to 150 gallons of diesel fuel from an O'Reilly truck. The RTN was closed with a Permanent Solution Statement in October 2021 by Omni Environmental Group. O'Reilly has scheduled repairs to the pavement area in spring 2023.
 - The Army has no record of being notified by O'Reilly of the spill release. The Army sent a letter to John Bounds (Environmental, Health, and Safety Manager at O'Reilly) on April 19, 2023, to express concerns that the Army was not notified when the spill occurred; a copy of the letter is included in Appendix F. The Army reiterated that (a) the LUC implementation plan specifies notification to the Army of excavations (planned or emergency) that may involve soil and groundwater, and (b) the deed prohibits any activities that may interfere with the Army's selected remedy. The Army determined that O'Reilly did not violate the Land Use Restriction prohibiting the use of groundwater for industrial or potable purposes, but plans to work with O'Reilly on a better notification process in the future.
- Minor damage to monitoring wells. A new flushmount roadbox was installed at one well (32Z-01-09XOB) by the S-A JV in May 2022. Some other roadboxes were observed to have cracked concrete; these locations will be monitored if/when future repairs are needed.
 - No evidence that groundwater extraction wells are present.
 - The access is sufficient to the site for monitoring.
 - No signs of increased exposure potential.

The S-A JV conducted an interview on January 27, 2023, with Anne-Marie Dowd (MassDevelopment) and Neil Angus (Devens Enterprise Commission). In addition, John Bounds and Joe Mrgan (O'Reilly Automotive) were contacted separately and responded in an email dated February 20, 2023. The interviews confirmed the following (Appendix F):

- The interviewees are familiar with the LUCs imposed on the property and documentation of these controls.
- No groundwater extraction wells are present.
- No proposed plans for property sale, future redevelopment, and construction or demolition activities at the site.
- No issues with site access for monitoring.

5.5 Conclusions

Groundwater flow at AOC 32/43A in 2022 was generally consistent with the site's historical flow patterns. The 2022 groundwater elevations indicate a minor upward flow component from bedrock to overburden in most areas, which is consistent with historical observations. Historical fluctuations in the vertical gradients may be due to changes in precipitation amounts from year to year (Table 3). There are no COCs in groundwater that exceed CGs at AOC 32/43A where the overburden/bedrock well pairs used to calculate vertical gradients are located.

The 2022 LTM results are consistent with the CSM (HGL 2008). At source area well 32M-01-18XBR, concentrations of 1,4 DCB, chlorobenzene, and VPH (C9-C10 Aromatics) exceeded their respective CGs or

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monitoring criteria in 2022. Mann-Kendall evaluation indicates 1,4-DCB and C9-C10 Aromatics have statistically significant decreasing trends in concentrations through time, but there is not a statistically significant trend for chlorobenzene at this well (Appendix E). Arsenic exceeded the CG in downgradient well 32M-01-14XOB but has statistically significant decreasing trend in concentrations through time (Appendix E). There were no other exceedances of CGs or monitoring criteria for COCs during the 2022 sampling event.

A vehicle leak occurred on the property, and the Army was unaware of the release. The Army determined that the property owner did not violate the land use restriction but will work with the property owner to develop a better notification process.

6 Devens Consolidation Landfill

6.1 Site Background

The DCL was constructed on the former Fort Devens golf course driving range to accommodate excavated material from seven remedial areas consisting of two study areas (SAs), four AOCs, and one pesticide removal project at three Fort Devens HAs. The seven DCL contributor sites were:

- SA 12. Construction debris and yard waste (approximately 8,700 yd³).
- SA 13. yard-waste (approximately 10,000 yd³).
- AOC 9. Wood, concrete, asphalt, metal, brick, glass, and tree stumps (approximately 121,000 yd³).
- AOC 11. Wood-frame hospital demolition debris (approximately 35,000 yd³).
- AOC 40. Construction debris, ash, stumps, and logs (approximately 125,000 yd³).
- AOC 41. Nonexplosive material and household debris (approximately 1,500 yd³).
- *Grant, Locust, and Cavite HAs*. Soils and walling material (approximately 3,530 tons).

The DCL contributor sites and the DCL are shown on Figures 1 and 17, respectively.

The ROD (HLA 1999b) included on- or off-site disposal options. The on-site landfill construction alternative was selected as the preferred alternative. Construction of the DCL began in September 2000 and was complete in November 2002. The Remedial Action Closure Report (Shaw Environmental Inc. [formerly Stone and Webster, Inc.] 2003) was accepted, certifying that the DCL was constructed and capped in accordance with the ROD (HLA 1999b), and was meeting the performance standards and/or response objectives of the remedial action. The ROD (HLA 1999b) required subsequent collection of samples from groundwater monitoring wells at DCL, in accordance with 310 Code of Massachusetts Regulations 19-132, to assess remedy effectiveness. LTM has been performed since completion of DCL construction.

In 2022, the USACE operated and inspected the landfill facility, and the S-A JV conducted the groundwater and leachate discharge sampling. Landfill leachate is discharged to the Fort Devens sewage system under an industrial wastewater discharge permit. Effluent criteria (established in 2006 and updated in 2009) and reporting requirements are specified in the leachate discharge permit.

In addition to the monitoring activities (Section 6.5), annual landfill maintenance activities were completed in 2022, including mowing of the landfill cap.

6.2 Groundwater Hydrology

During spring and fall 2022 LTM at DCL, water level measurements were performed at a total of seven monitoring wells. Tables 1 and 2 present the measurements and corresponding calculated groundwater elevations for bedrock wells in the spring and fall 2022, respectively. Groundwater flow is to the northeast, as shown on Figures 18 and 19 for spring and fall 2022, respectively. The gradient ranged from approximately 0.043 ft/ft (Figure 18) to 0.044 ft/ft (Figure 19) in spring and fall 2022, using upgradient monitoring well LFM-99-02B and LFM-99-05B, respectively. These observations are consistent with historical observations at DCL.

6.3 Groundwater Sampling

Groundwater sampling is completed semiannually in accordance with the LTMMP (Sovereign/HGL 2015). A total of four wells were sampled in spring 2022 and three wells in fall 2022 (monitoring well LFM-03-07 was observed to be dry during the fall 2022 monitoring event). Samples were analyzed for the following parameters: VPH, EPH, pesticides, total metals (select list), TDS, chloride/sulfate, nitrate/nitrite, alkalinity, cyanide, and COD. Tables 13 and 14 present the analytical results for the spring and fall 2022 LTM wells.

Water level measurements were performed at monitoring wells LFM-99-01B, LFM-99-03B, and LFM 99-05B during the spring and fall 2022 LTM events to evaluate if these wells should also be sampled. If the depth to water is less than the trigger depth (i.e., higher water table elevation), there is a potential for groundwater to come into contact with the bottom of the landfill, triggering the requirement to also sample these locations. Exhibit 6-1, below, lists the shallow trigger depths, along with groundwater elevations from spring and fall 2022. Sampling of these wells was not required in 2022, because the elevation for all wells was below the trigger depth.

Exhibit 6-1 Water Level Readings for Select DCL Monitoring Wells, Spring and Fall 2022 LTM

Well Identification	Top of Casing Elevation (feet NAVD88)	Groundwater Elevation Trigger for Required Sampling (feet NAVD88)	Groundwater Elevation Spring 2022 (feet NAVD88)	Groundwater Elevation Fall 2022 (feet NAVD88)
LFM-99-01B	350.67	345.00 or greater	325.89	323.15
LFM-99-03B	342.08	335.00 or greater	302.58	298.51
LFM-99-05B	316.58	315.00 or greater	297.92	294.27

6.3.1 2022 Long-Term Monitoring Data Summary

Tables 13 and 14 present analytical results from spring and fall 2022 LTM, respectively. Concentrations of EPH, VPH, pesticides, total metals, and cyanide were either non-detect or less than the monitoring criteria, consistent with historical data collected since 2003. Results of spring and fall 2022 general chemistry parameters (total cyanide, COD, TDS, chloride, sulfate, nitrate/nitrite, and total alkalinity) were consistent with historical data (Tables 13 and 14). Appendix D contains the DCL historical data from 2003 through 2022.

6.3.2 Water Quality Parameters

General water quality chemistry parameters (pH, temperature, specific conductivity, ORP, DO, and turbidity) were measured at each of the sampled wells concurrent with low-flow sampling, and were used to verify groundwater stabilization within each well before sampling. Tables 13 and 14 provide the final field readings taken before collection of each groundwater sample. Groundwater at these wells was oxic in both 2022 events (ORP greater than 50 mV and DO greater than 1 mg/L). Historically, COC detections at DCL wells have been sporadic and low concentration. No definitive correlation has been established between measured water quality parameters and the presence or absence of contamination in the sampled wells.

6.4 Leachate System Monitoring

The DCL is permitted to discharge industrial wastewater to the Fort Devens sewerage system in accordance with Industrial Discharge Permit No. 017 granted by MassDevelopment. Leachate sampling is performed each year between October 1 and December 31, and self-monitoring reports are due to MassDevelopment by January 5 the following year. On October 27, 2022, samples were collected from the leachate system building (located to the east of the landfill) and submitted to Eurofins for analysis of VOCs, SVOCs, pesticides, PCBs, gasoline-range organics, total metals (select list), total suspended solids, pH, total phenolics, and total cyanide. Table 15 presents the analytical results. There were no permit exceedances for any parameters.

In addition to leachate sampling, the DCL system is inspected monthly and leachate discharge volumes are recorded. Monitoring results are used to calculate leachate discharge quantities for comparison with historical discharge data. As presented in Table 16, the annual leachate discharge quantity from 2022 (165,191 gallons) was lower than historical quantities due to operational issues with one of the transfer pumps and drought conditions throughout the summer months (Table 3). The transfer pump was repaired in November 2022 and the system has been operating properly since.

6.5 Landfill Inspection and Gas Monitoring

Since its completion, the DCL has been inspected on a routine basis to ensure controls remain in place to be protective of human health and the environment. The inspection frequency was changed from semiannual to annual in 2008 (HGL 2008). Since the cap was completed in 2002, post-closure inspection and monitoring has now been performed for 20 years. Planning should commence for the performance time and metrics to reduce LTM and sampling activities, or to perform them as a reduced frequency, after 30 years, in accordance with Resource Conservation and Recovery Act Subtitle C landfill cap regulations for post-closure monitoring periods of performance.

S-A JV and USACE personnel inspected the DCL landfill on December 1, 2022, and recorded observations regarding the vegetative cover, vegetation types, erosion, settlement, and general condition of various features. Appendix G provides the fall 2022 inspection report. Primary findings are summarized below:

- The landfill cap and perimeter drainage system were found to be in good condition, with no apparent settlement or significant erosion.
- In general, the vegetative cap appeared healthy. As noted during previous inspections, some small, woody shrub species have invaded the perimeter drainage system and the landfill cap. The woody vegetation is cut low to the ground during annual mowing.
- The perimeter fence is in fair condition adjacent to the security gate. The fence along with the security gate and perimeter drainage system minimize potential entry onto the landfill cap by motor vehicles. These access limitations appear to be adequate.
- The cap drainage system was observed to be in good condition. Drainage channels were free of sediment and debris, with no significant settlement or stone displacement. The gabion slope drains were in good condition, with minimal vegetation present.
- Perimeter toe drains were in good condition and appeared to be functioning properly, with no visible signs of erosion or stability issues.

- The detention basin northeast of the DCL was also noted to be in good condition. Its pond drains, culvert, and outfall areas were generally free of debris and vegetative growth.
- New label tags noted were installed on all gas vents prior to the 2022 inspection.

In 2016, a building was constructed at 85 Patton Road, Devens, Massachusetts, approximately 150 feet east of the southeastern edge of the landfill. The MassDEP had requested that gas probes be installed between the landfill and the new structure, and that landfill gas monitoring be conducted to evaluate whether landfill gas is migrating from the landfill through soil and/or in groundwater that could create a hazardous condition in the area of the new structure. The Army prepared the Work Plan for Installation of Perimeter Landfill Gas Monitoring Wells (KGS 2018) and installed and sampled three gas probes (LFGM-18-01, LFGM-18-02, and LFGM-18-03) on December 7, 2018 (Figure 17). Appendix G presents the results of sampling of the three gas probes conducted on December 1, 2022. Methane, the primary explosive landfill gas COC that could be generated from the DCL, was not detected (0% lower explosive limit). VOC results were also non-detect, and carbon dioxide ranged from 1.9 to 2.8%. Hydrogen sulfide and carbon monoxide were not detected. Therefore, no soil gas hazard for occupants of the adjacent building was identified.

Primary recommendations are summarized below, and details are provided in Appendix G:

- Routine and general landfill maintenance activities that will continue to be performed include annual mowing and control of encroaching vegetation, such as clearing large/woody vegetative growth from the cap, drainage channels, and riprap. Small shrubs growing on the landfill cap should continue to be cut low during the annual mowing, and/or cut as flush to the ground as feasible during the annual maintenance program.
- Annual mowing of the cap will be done in early fall to avoid harming ground-nesting songbirds. Mowing will include the adjacent open field and detention pond areas.
- The annual inspection of landfill cap components will continue. The inspection should continue to be performed in the fall, soon after mowing is completed (i.e., within 1 to 2 weeks) and preferably within 48 hours after a precipitation event to help inspect the effectiveness of surface runoff in the drainage swales. Landfill gas monitoring should be performed on a dry day.

6.6 Land-Use Controls, Interviews, and Inspection

MassDevelopment owns the DCL property and granted the Army a permanent easement in 2001 to build and operate the landfill (Army and MassDevelopment 2001). DCL contributor sites AOC 9, AOC 40, and SA 13 were transferred from the Army to MassDevelopment in March 2006. The March 2006 deed included use restrictions on the contributor sites to prevent residential development of the properties (Army and MassDevelopment 2006).

LUC inspections are conducted per the LTMMP (Sovereign/HGL 2015). Appendix F contains site-specific annual LUC checklists for the DCL and its contributor sites, AOC 9, AOC 40, and SA 13, including physical on-site inspection and interview components.

An LUC inspection was performed on December 1, 2022, which confirmed the following:

- No evidence of development or damage in the area of the remedy.
- No damage to monitoring wells.
- No evidence that groundwater extraction wells are present.
- The access is sufficient to the site for monitoring.

- No signs of increased exposure potential.

The S-A JV conducted an interview on January 27, 2023, with Anne-Marie Dowd (MassDevelopment) and Mr. Neil Angus (Devens Enterprise Commission) regarding the following items:

- The interviewees are familiar with the LUCs imposed on the property and documentation of these controls.
- No groundwater extraction wells are present.
- No proposed plans for property sale, future redevelopment, and construction or demolition activities at the site.
- No issues with site access for monitoring.

In addition to the on-site DCL inspection, an LUC inspection of the DCL contributor sites (AOC 9, AOC 40, and SA 13) was performed on December 14, 2022. Findings revealed no abnormalities or changes in land use (Appendix F), and there was no evidence of residential development at the contributor sites.

6.7 Conclusions

The 2022 results for the DCL groundwater monitoring wells are consistent with groundwater results from previous LTM events. There were no exceedances of the DCL Wastewater Discharge Permit No. 017 criteria for leachate in October 2022.

The ROD (HLA 1999b) remedy and LTM Plan (HGL 2008) include LUCs to limit potential exposure to contaminated soil and groundwater under both existing and future site use. The 2022 LUC inspections and interviews indicate the LUCs continue to be in place and in effect for both the DCL and contributor sites (AOC 9, AOC 40, and SA 13). Per the requirements of the 2006 transfer deed, these contributor sites are not being used, or under development, for residential purposes.

7 Housing Areas and 37-Millimeter Impact Area

7.1 Site Background

The Grant HA, Oak HA, Maple HA, and 37 mm Impact Area are located within the Main Post, between Hospital Road, El Carney Street, and the Nashua River. Figure 20 shows the location of the HAs and 37 mm Impact Area. Historical records indicate that training was conducted within the wooded areas from 1917 until a multifamily housing development was constructed in the late 1950s. A 37 mm range was located along the western boundary of the Grant HA with an approximate 2-acre impact area on the northern slope of Oak Hill.

In 1994 and 1995, the USACE completed a facility-wide archival search to document the locations of all training areas and ranges at Fort Devens. Based on the findings of this study, several former weapons training ranges within the former installation were identified. Several potential munitions and explosives of concern (MEC) sites were identified. The Grant HA, along with portions of the Oak and Maple HAs, were designated as Area 11. A 1995 munitions response investigation confirmed the presence of MEC throughout Area 11, with a clustering of MEC located at the southern end of the area (USACE 1995). In 1996, MEC removal actions were performed at the 37 mm Impact Area, extending into the former Oak and Maple HAs. The removal action is summarized in the Final Removal Action Report (Human Factors Applications, Inc. 1996). All historical removal actions were documented in the Preliminary Assessment/Supplemental Site Inspection Comprehensive Report (Weston 2008).

A ROD (Weston 2009) for the Grant HA and 37 mm Impact Area was signed in 2009. The remedial action objective is to prevent direct contact with UXO, which may remain in the soils at the site. As noted in the ROD (Weston 2009), the LUCs are “preventative for direct contact as they educate the contractor and resident as to the potential presence of UXO and the actions to be taken if presumed UXO is encountered, which included not handling the UXO”. Pursuant to the ROD (Weston 2009), a Land-Use Control Implementation Plan (LUCIP; Army BRAC 2011) was issued in May 2011. LUCs for the Grant HA are addressed through affirmative actions, which include the following:

- Public education to property owners, residents, as well as any construction and/or utility contractors via utility bill inserts, educational materials posted on a community website, and training for contractors conducting ground-intrusive activities on the property.
- A deed notice that will be inserted into any Grant HA deeds by MassDevelopment to convey there is no evidence of additional UXO present at the site, but that the possibility does remain that UXO could be discovered in the future.

Additionally, the LUCIP indicates that LUCs for the 37 mm Impact Area are addressed through institutional controls, access restrictions, affirmative measures, and prohibitive directives including the following:

- Institutional controls to be implemented through a Grant of Environmental Restrictions and Easements.
- Access controls would be implemented using signage and fencing to restrict public access.
- Public education to property owners, residents, as well as any construction and/or utility contractors conducting ground-intrusive activities on the property.
- Prohibitive directives to include restrictions on all ground-intrusive activities.
- Annual site inspections to evaluate the access controls, monitor the potential presence of surficial UXO, and evaluate the overall effectiveness of the LUCs.

The Army conducts annual reviews, including interviews and a physical inspection of the 37 mm Impact Area, to confirm the overall effectiveness and compliance with the established LUCs in the Grant HA and the 37 mm Impact Area. If deemed necessary, the annual review of LUCs at the Grant HA may also include a physical inspection. The annual review of LUCs at the Grant HA also includes verification that the website, utility bill inserts, UXO awareness training, inclusion of the supplemental deed notice in deeds conveying the Grant HA (or portions thereof) and other requirements set forth in the LUCIP (Army BRAC 2011) are being properly implemented.

Separately, the Oak and Maple HAs were evaluated and a Focused Feasibility Study Addendum (Sovereign/HGL 2013) was prepared to address the former Oak and Maple HAs, which recommended LUCs. The remedy for the former Oak and Maple HAs was incorporated within the Grant HA and 37 mm Impact Area via an Explanation of Significant Differences (Sovereign/HGL 2014). The application of LUCs was specified in a Land-Use Control Implementation Plan Addendum (USACE 2021), which was prepared for the Oak and Maple HAs, in addition to a portion of the Grant HA, which was rezoned for commercial uses and is currently owned by Commonwealth Fusion Systems (CFS). The subject area of the LUCIP Addendum (USACE 2021) is collectively referred to as the Restricted Area (Figure 20) and is also known as 111 Hospital Road (CFS-1) and 117 Hospital Road (CFS-2). Additions to the ROD for the Restricted Area include the following:

- The inclusion of a deed notice for the prohibition of residential reuse within the LUCs
- Notice of Activity and Use Limitation (NAUL) to address the potential presence of UXO and other MEC
- LUC affirmative measures for public education
- Construction-related activities, including (but not limited to) the following:
 - Provision of a site-specific soil management plan
 - Provision of UXO/MEC awareness briefing
 - Perform MEC investigation prior to the removal of asphalt roads and/or any intrusive activity beneath existing asphalt roads
 - Conduct instrument-assisted visual inspections of construction areas
 - Provide on-call MEC construction support for all intrusive activities.

The portion of the Grant HA subject to the ROD (Weston 2009) and LUCIP (Army BRAC 2011) is currently zoned for residential reuse per the Devens Reuse Plan (Vanasse Hangen Brustlin, Inc. 1994). MassDevelopment executed and recorded a Grant of Environmental Restrictions and Easements for the Grant HA, which was recorded at the Worcester Registry of Deeds on December 19, 2011 (book 48291, page 138).

The Restricted Area (comprising the Oak HA, Maple HA, and remaining portion of the Grant HA) subject to the LUCIP Addendum (USACE 2021) is currently zoned for commercial construction. MassDevelopment executed and recorded a NAUL, which was recorded at the Worcester Registry of Deeds on April 27, 2021, book 65027, page 30. The 37 mm Impact Area continues to be fenced off and restricted from any land use other than utility repair or emergency work.

7.2 Land-Use Controls

The annual LUC checklist (Appendix G) was completed for the former HAs and 37 mm Impact Area, including physical on-site inspections (if deemed necessary) and interviews. An interview was conducted with Anne-Marie Dowd (MassDevelopment), Neil Angus (Devens Enterprise Commission), Rich Holcomb (Commonwealth Fusion

Systems), and Kathleen Brill (Foley Hoag LLP) on January 23, 2023, to discuss compliance with the LUCs. The following items were evaluated:

- Discuss any reports during the reporting year of any objects discovered on site, including any findings of UXO.
- Describe any ground-intrusive activities conducted during the reporting year.
- Verify the existence of an educational website for the public.
- Verify the inclusion of required utility bill inserts.
- Verify the posting of utility bill insert in a conspicuous location.
- Verify distribution of the current soils management policy to construction workers and contractors.
- Verify that UXO awareness training is being conducted (if construction activities occurred during the reporting year).
- Verify that the supplemental deed notice has been included in deeds conveying of the Grant HA.
- Verify if any amendments to the NAUL were recorded/executed for the Restricted Area.

7.2.1 37-Millimeter Impact Area

In the 37 mm Impact Area, LUCs were verified during a site visit on December 21, 2022. The inspection was performed to identify land-use conditions (fencing, signage, and vegetation), any areas of UXO concern, (performed by sweeping 10% of the site with a metal detector), and any evidence of site use changes. The fence around the 37 mm Impact Area was inspected for damage and a metal detector was used to sweep the ground. No UXO were detected, and metal detector findings were limited to other metallic objects. The access gates and signage were observed to be in good condition, with the exception of a small area of fence that was damaged by a fallen tree; the fence will be scheduled for repair in 2023. Overall, the findings of the site inspection revealed no abnormalities.

7.2.2 Restricted Area

In the Restricted Area (former Oak and Maple HA, portion of the former Grant HA), construction activities continued on the CFS manufacturing and research facility. CFS submitted a Completion Summary Report to MassDevelopment and the USEPA on March 25, 2022, which summarized MEC construction support work completed from May through December 2021; a copy of the Completion Report was included in the 2021 Annual Report (S-A JV 2022b). In 2022, no additional intrusive activities or soil management activities were completed, no site walks or physical inspections were required by MassDevelopment or the Devens Enterprise Commission, and no UXOs were encountered.

7.2.3 Unrestricted/Residential Use Area

In the unrestricted/residential use area (portion of the former Grant HA), Phase II residential development construction continues. Construction work completed on a total of three new duplexes on Powell Street (units 1A/1B, 3A/3B, and 5A/5B), and foundation work was started on planned multi-family buildings on 77 Grant Road (construction is currently on hold). The Supplemental Deed Notice was included in deeds conveying portions of the unrestricted/residential use area, in accordance with the LUC provisions. Appendix F contains copies of the

deed notice and utility bill insert. In addition, all contractors are provided with copies of the Devens Soil Management Policy and are required to implement all requirements within the documents.

On November 22, 2022, the Devens Fire Department and State Police Bomb Squad responded and destroyed a hand grenade. The grenade was found in a forested area in the western part of the former Grant HA (adjacent to the Oxbow National Wildlife Refuge); the item was found and unearthed by an individual using a metal detector. No injuries or damage were reported. No additional UXOs were encountered in the unrestricted/residential use area.

7.3 Conclusions

The remedial action objective for the HAs and the 37 mm Impact Area is to prevent direct contact with UXOs that may remain at the site(s). During the 2022 review period, the former Grant, Oak, and Maple HAs, and the 37 mm Impact Area were subject to annual LUC interviews, on-site inspections, as well as other affirmative measures and prohibitive directives (e.g., distribution of educational materials, providing awareness courses for site workers and residents, implementing deed notices, and maintaining signage). Results of the annual compliance monitoring indicate that no deviations or deficiencies to the LUCs were evident and corrective action(s) were not necessary. A single UXO was discovered in the unrestricted/residential use area and was removed from the property without incident. There were no other UXOs discovered on site during 2022. Proper signage remains in place and all contractors are required to attend pre-construction meetings where UXO awareness information is presented. Copies of the Soils Management Plan (residential reuse portion of the Grant HA), Site-Specific Soils Management Plan (Restricted Area), and UXO information are available on the Devens Enterprise Commission website (www.devensec.com).

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Tables

Table 1
Groundwater Elevations Spring 2022 LTM Event
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Site Name	Well Identification ¹	Date of Gauging	DTW (ft below MPE)	MPE (ft NAVD88)	Groundwater Elevation (ft NAVD88)
DCL	LFM-03-07	4/28/2022	17.80	315.14	297.34
	LFM-99-01B	4/28/2022	24.78	350.67	325.89
	LFM-99-02B	4/28/2022	16.19	353.83	337.64
	LFM-99-03B	4/28/2022	39.50	342.08	302.58
	LFM-99-05A	4/28/2022	21.63	316.58	294.95
	LFM-99-05B	4/28/2022	18.66	316.58	297.92
	LFM-99-06ARP	4/28/2022	14.99	337.84	322.85
AOC 57	57M-03-01X	4/28/2022	14.04	235.73	221.69
	57M-03-02X	4/28/2022	4.90	224.84	219.94
	57M-03-03X	4/28/2022	0.34	220.00	219.66
	57M-03-04X	4/28/2022	2.31	221.39	219.08
	57M-03-05X	4/28/2022	2.98	221.88	218.90
	57M-03-06X	4/28/2022	2.53	221.87	219.34
	57M-95-03X	4/28/2022	10.35	232.79	222.44
	57M-95-05X	4/28/2022	14.31	235.15	220.84
	57M-95-06X	4/28/2022	12.39	234.39	222.00
	57M-95-07X	4/28/2022	2.60	222.36	219.76
	57M-96-10X	4/28/2022	6.53	228.75	222.22
	57M-96-11X	4/28/2022	2.71	222.20	219.49
	57M-96-12X	4/28/2022	4.58	225.80	221.22
	57M-96-13X	4/28/2022	4.37	225.58	221.21
	57P-98-03X	4/28/2022	2.22	220.39	218.17
	57P-98-04X	4/28/2022	3.63	221.75	218.12
	57WP-05-01	4/28/2022	1.90	NS	NS
	57WP-06-02	4/28/2022	1.13	220.29	219.16
57WP-06-03	4/28/2022	0.63	220.51	219.88	
AOC 32/43A	32M-01-13XBR	4/27/2022	16.35	257.88	241.53
	32M-01-14XBR	4/27/2022	21.71	256.06	234.35
	32M-01-14XOB	4/27/2022	23.83	256.56	232.73
	32M-01-15XBR	4/27/2022	19.65	258.36	238.71
	32M-01-16XBR	4/27/2022	21.70	257.50	235.80
	32M-01-17XBR	4/27/2022	24.42	259.11	234.69
	32M-01-18XBR	4/27/2022	16.10	258.32	242.22
	32M-92-01X	4/27/2022	16.78	260.17	243.39
	32M-92-03X	4/27/2022	26.84	260.02	233.18
	32Z-01-05XOB	4/27/2022	28.86	261.40	232.54
	32Z-01-06XBR	4/27/2022	15.13	261.85	246.72
	32Z-01-07XOB	4/27/2022	14.30	259.48	245.18
	32Z-01-08XOB	4/27/2022	17.50	260.49	242.99
	32Z-01-09XOB	4/27/2022	NM	NM	NM
	32Z-01-10XBR	4/27/2022	15.73	257.41	241.68
	32Z-01-11XBR	4/27/2022	dry	261.50	DRY
	32Z-01-12XBR	4/27/2022	18.83	257.85	239.02
	32Z-99-02X	4/27/2022	22.54	259.71	237.17
	43M-01-16XBR	4/27/2022	23.97	256.84	232.87
	43M-01-16XOB	4/27/2022	24.05	256.88	232.83
43M-01-17XBR	4/27/2022	25.63	258.29	232.66	

Table 1
Groundwater Elevations Spring 2022 LTM Event
2022 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts



Site Name	Well Identification ¹	Date of Gauging	DTW (ft below MPE)	MPE (ft NAVD88)	Groundwater Elevation (ft NAVD88)
AOC 32/43A (cont.)	43M-01-17XOB	4/27/2022	25.56	258.08	232.52
	43M-01-20XBR	4/27/2022	25.89	257.30	231.41
	43M-01-20XOB	4/27/2022	25.34	257.40	232.06
	SHL-15	4/27/2022	17.04	258.83	241.79
	SHL-25	4/27/2022	25.35	258.01	232.66

Notes:

1. The OB and BR designations associated with select well identifications denote wells screened in overburden and bedrock, respectively.

2. Monitoring well 32Z-01-09XOB was damaged/inaccessible during the synoptic gauging event; the roadbox was later replaced.

Acronyms and Abbreviations:

AOC = Area of Contamination

DCL = Devens Consolidation Landfill

DTW = depth to water

ft = feet

LTM = long-term monitoring

MPE = measuring point elevation

NAVD88 = North American Vertical Datum of 1988

NS = not surveyed

Table 2
Groundwater Elevations Fall 2022 LTM Event
2022 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Site Name	Well Identification	Date of Gauging	DTW (ft below MPE)	MPE (ft NAVD88)	Groundwater Elevation (ft NAVD88)
AOC 43G	AAFES-2	10/31/2022	23.91	301.72	277.81
	AAFES-5	10/31/2022	22.21	299.80	277.59
	AAFES-6R	10/31/2022	20.23	298.74	278.51
	AAFES-7	10/31/2022	10.69	258.80	248.11
	XGM-93-02X	10/31/2022	29.83	309.01	279.18
	XGM-94-04X	10/31/2022	20.61	300.69	280.08
	XGM-94-06X	10/31/2022	22.74	284.07	261.33
	XGM-94-07X	10/31/2022	22.22	294.82	272.60
	XGM-94-08X	10/31/2022	26.22	298.98	272.76
XGM-94-10X	10/31/2022	25.50	301.96	276.46	
XGM-97-12X	10/31/2022	26.71	308.70	281.99	
DCL	LFM-03-07	10/27/2022	23.34	315.14	291.80
	LFM-99-01B	10/27/2022	27.52	350.67	323.15
	LFM-99-02B	10/27/2022	19.42	353.83	334.41
	LFM-99-03B	10/27/2022	43.57	342.08	298.51
	LFM-99-05A	10/27/2022	25.61	316.58	290.97
	LFM-99-05B	10/27/2022	22.31	316.58	294.27
	LFM-99-06A-RP	10/27/2022	17.31	337.84	320.53
AOC 69W	69W-94-12	11/1/2022	9.53	228.14	218.61
	69W-94-13	11/1/2022	8.53	226.99	218.46
	69W-94-14	11/1/2022	9.48	227.22	217.74
	69WP-08-01	11/1/2022	4.49	NS	NS
	69WP-13-01	11/1/2022	3.88	220.70	216.82
	Willow Brook PZ	11/1/2022	2.45	218.17	215.72
	ZWM-01-25X	11/1/2022	7.39	224.71	217.32
	ZWM-01-26X	11/1/2022	8.82	226.81	217.99
	ZWM-95-15X	11/1/2022	7.45	225.01	217.56
	ZWM-95-16X	11/1/2022	8.01	227.58	219.57
	ZWM-95-17X	11/1/2022	16.35	237.83	221.48
	ZWM-95-18X	11/1/2022	5.50	222.15	216.65
	ZWM-99-22X	11/1/2022	7.71	226.72	219.01
	ZWM-99-23X	11/1/2022	7.33	225.08	217.75
	ZWM-99-24X	11/1/2022	7.69	225.85	218.16
ZWP-95-01X	11/1/2022	7.88	226.04	218.16	
ZWP-95-02X	11/1/2022	6.20	222.83	216.63	

Acronyms and Abbreviations:

- AOC = Area of Contamination
- DCL = Devens Consolidation Landfill
- DTW = depth to water
- ft = feet
- LTM = long-term monitoring
- MPE = measuring point elevation
- NAVD88 = North American Vertical Datum of 1988
- NS = not surveyed

Table 3
Monthly Precipitation Data
2022 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Month	Year																			Average
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
January	0.75	3.46	4.58	2.72	2.38	2.49	3.31	3.66	2.18	1.38	2.18	2.73	1.48	3.00	2.19	3.40	1.68	2.48	2.28	2.54
February	1.32	2.17	2.28	1.21	8.85	2.51	6.05	4.11	1.12	2.91	3.16	0.55	3.36	2.34	3.07	3.00	3.05	2.22	4.91	3.06
March	2.97	4.08	0.53	3.97	5.28	2.40	10.61	4.08	1.25	2.31	4.16	1.03	3.12	3.86	2.88	1.95	3.34	1.72	2.71	3.28
April	7.67	5.47	2.21	7.09	3.61	4.00	1.43	5.05	2.87	1.62	3.25	0.33	1.89	4.85	5.25	6.72	5.40	4.22	3.72	4.03
May	3.43	4.25	7.32	4.37	1.99	3.97	3.37	3.81	3.13	5.38	3.29	0.10	2.04	6.21	1.61	3.12	1.85	4.22	1.71	3.43
June	1.67	3.87	9.31	1.56	4.02	6.41	3.53	5.69	4.03	8.53	1.76	2.76	1.04	3.97	4.71	5.56	1.93	0.88	2.16	3.86
July	4.72	1.67	1.71	6.25	6.35	9.61	4.01	2.27	1.46	3.46	4.10	1.73	1.92	3.37	3.49	3.64	2.94	8.24	1.72	3.82
August	2.77	2.56	4.38	1.40	4.66	2.64	3.58	10.99	4.92	2.09	2.25	1.17	2.55	1.83	10.10	4.00	1.15	4.04	1.28	3.60
September	7.35	1.67	2.87	2.25	8.05	1.28	2.48	6.94	3.06	1.64	1.07	3.23	0.05	4.54	7.79	0.48	1.23	5.82	4.75	3.50
October	1.91	13.46	6.10	3.35	1.81	3.99	6.17	7.12	5.12	1.28	5.22	3.60	4.58	9.12	4.12	6.01	4.18	3.39	4.55	5.00
November	3.42	4.40	6.38	2.67	3.66	3.43	3.92	3.94	0.47	2.66	3.60	1.66	3.27	1.22	8.81	0.62	4.67	2.05	3.38	3.38
December	3.89	3.79	1.77	3.67	3.78	3.69	4.08	4.84	3.39	3.46	4.44	2.10	3.40	2.50	3.61	0.28	5.15	3.12	6.44	3.55
TOTAL	41.87	50.85	49.44	40.51	54.44	46.42	52.54	62.50	33.00	36.72	38.48	20.99	28.70	46.81	57.63	38.78	36.57	42.40	39.61	43.07

Notes:

Monthly data retrieved from the National Oceanic and Atmospheric Administration (NOAA) data inventory (NOWData - NOAA Online Weather Data).

Values given in total inches of precipitation per month

Source Location: Fitchburg Municipal Airport, Massachusetts Weather Station

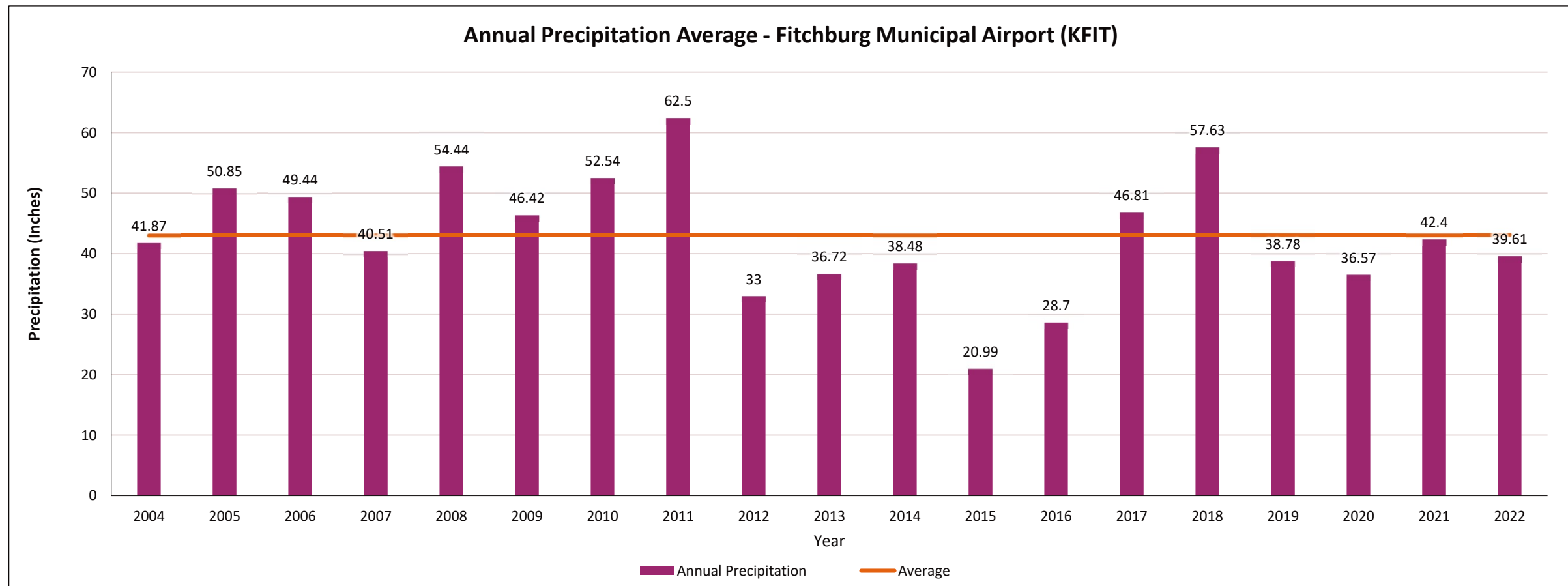


Table 4
Analytical Methods, Containers, Holding Times, and Preservatives
2022 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Site/Events	Parameter	Analytical Method ¹	Target Analytes	Sample Container ²	Preservative	Holding Time
AOC 57 (Spring)	Dissolved Metals*	SW6010C/6020A	As, Fe, Mn	1 x 250-ml Polyethylene	HNO ₃ to pH < 2; 4°± 2°C	180 Days
	Total Metals	SW6010C/6020A	As, Fe, Mn	1 x 250-ml Polyethylene	HNO ₃ to pH < 2; 4°± 2°C	180 Days
AOC 32/43A (Spring)	VOCs	SW8260B	TAL	3 x 40-ml vials with teflon septa screw caps; no headspace	HCl to pH < 2; 4°± 2°C	14 Days
	VPH	MADEP-VPH-04-1.1	VPH/BTEX	3 x 40-ml vials with teflon septa screw caps; no headspace	HCl to pH < 2; 4°± 2°C	14 Days
	Total Metals	SW6010C/6020A	As, Mn	1 x 250-ml Polyethylene	HNO ₃ to pH < 2; 4°± 2°C	180 Days
AOC 69W (Fall)	EPH	MADEP-EPH-04-1.1	EPH	2 x 1-Liter Glass Amber with Teflon- lined lid	HCl to pH < 2; 4°± 2°C	7 Days (extraction) 40 Days (analyses)
	Dissolved Metals*	SW6010C/6020A	As, Fe, Mn	1 x 250-ml Polyethylene	HNO ₃ to pH < 2; 4°± 2°C	180 Days
AOC 43G (Fall)	VPH	MADEP-VPH-04-1.1	VPH/BTEX	3 x 40-ml vials with teflon septa screw caps; no headspace	HCl to pH < 2; 4°± 2°C	14 Days
	Total Metals	SW6010C	Fe, Mn	1 x 250-ml Polyethylene	HNO ₃ to pH < 2; 4°± 2°C	180 Days
	Alkalinity	SM2320B	None	1 x 250-ml Polyethylene	Store at 4°± 2°C	14 Days
DCL (GW) (Spring/Fall)	VPH	MADEP-VPH-04-1.1	VPH/BTEX	3 x 40-ml vials with teflon septa screw caps; no headspace	HCl to pH < 2; 4°± 2°C	14 Days
	EPH	MADEP-EPH-04-1.1	EPH	2 x 1-Liter Glass Amber with Teflon- lined lid	HCl to pH < 2; 4°± 2°C	7 Days (extraction) 40 Days (analyses)
	Pesticides	SW8081A	TAL	2 x 1-Liter Glass Amber with Teflon- lined lid	Store at 4°± 2°C	7 Days (extraction) 40 Days (analyses)
	Select Metals (Total)	SW6010C/6020A	Select Metals for DCL Groundwater: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag	1 x 250-ml Polyethylene	HNO ₃ to pH < 2; 4°± 2°C	180 Days
	Mercury	SW7470A	Hg			28 days
	Cyanide (Total)	SW9012B	Cyanide (Total)	1 x 250-ml Polyethylene	NAOH to pH > 12; 4°± 2°C	14 Days
	TDS	SM2540C-11	None	1 x 500-ml Polyethylene	Store at 4°± 2°C	7 days
	Anions	SW9056A	Chloride, Sulfate	1 x 125-ml Polyethylene	Store at 4°± 2°C	28 days
Alkalinity	SM2320B	None	1 x 250-ml Polyethylene	Store at 4°± 2°C	14 Days	
DCL (GW) (Spring/Fall, cont.)	COD	410.4	None	1 x 250-ml Polyethylene	H ₂ SO ₄ to pH < 2; 4°± 2°C	28 Days
	Nitrate/Nitrite as N	E353.2	Nitrate/Nitrite as N	1 x 500-ml Polyethylene	H ₂ SO ₄ to pH < 2; 4°± 2°C	28 Days
DCL (Leachate) (Fall)	Select Metals (Total)	SW6010C/6020A	Select Metals for DCL Leachate: Al, As, Cd, Cr, Cu, Pb, Ni, Ag, Zn	1 x 250-ml Polyethylene	HNO ₃ to pH < 2; 4°± 2°C	180 Days
	Mercury	SW7470A	Hg	1 x 250-ml Polyethylene	HNO ₃ to pH < 2; 4°± 2°C	28 days
	Cyanide (Total)	SW9012B	Cyanide (Total)	1 x 250-ml Polyethylene	NAOH to pH > 12; 4°± 2°C	14 Days
	TSS/pH	SM2540D/SW9040C		1 x 1-liter Polyethylene	Store at 4°± 2°C	7 days
	TPH as DRO	SW8015B	DRO	2 x 1-Liter Glass Amber with Teflon- lined lid	Store at 4°± 2°C	7 Days (extraction) 40 Days (analyses)
	Total Phenolics	SW9065	Total Phenols	1 x 250-ml amber	H ₂ SO ₄ to pH < 2; 4°± 2°C	28 days
	TTO (VOCs)	624.00	VOCs	3 x 40-ml vials with teflon septa screw caps; no headspace	HCl to pH < 2; 4°± 2°C	14 Days
	TTO (SVOCs)	625.00	SVOCs	2 x 1-liter amber	Store at 4°± 2°C	7 Days (extraction) 40 Days (analyses)
	TTO (Pesticides/ PCBs)	SW8081B/8082A	Pesticides/PCBs	2 x 1-liter amber	Store at 4°± 2°C	7 Days (extraction) 40 Days (analyses)

Notes:

* Samples submitted for dissolved metals are field filtered.

¹ "Methods for Chemical Analysis of Water and Wastes", Cincinnati, OH, March 1979, EPA 600-4-79-020.

"Test Methods for Evaluating Solid Waste, Physical and Chemical Methods", EPA SW-846, Update 8, 2014.

² Additional sample containers/volumes are required for matrix quality control samples.

Acronyms and Abbreviations:

°C = degrees Celsius

AOC = Area of Contamination

BTEX = benzene, toluene, ethylbenzene, and xylenes

COD = chemical oxygen demand

DCL = Devens Consolidation Landfill

DRO = diesel-range organics

EPA = United States Environmental Protection Agency

EPH = extractable petroleum hydrocarbon

GW = groundwater

PCB = polychlorinated biphenyl

SVOC = semi-volatile organic compound

TAL = Target Analyte List

TDS = total dissolved solids

TPH = total petroleum hydrocarbons

TSS = total suspended solids

TTO = total toxic organics

VOC = volatile organic compound

VPH = volatile petroleum hydrocarbon

Table 5
Monitoring Wells, Well Points, Piezometers, and Surface Water Locations Selected for Long-Term Monitoring
2022 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Location ID ¹	Ground Surface Elevation	Top of Casing Elevation	Top of Screen Interval	Bottom of Screen Interval	Top of Screen Interval	Bottom of Screen Interval
	(ft NAVD88)	(ft NAVD88)	(ft BGS)	(ft BGS)	(ft NAVD88)	(ft NAVD88)
AOC 57 (Annual Sampling)						
57-SW-1	--	--	--	--	--	--
57M-03-01X	234.44	235.73	10	20	224.44	214.44
57M-03-02X	222.99	224.84	2	12	220.99	210.99
57M-03-03X	218.98	220.00	2	12	216.98	206.98
57M-03-04X	219.46	221.39	2	12	217.46	207.46
57M-03-05X	219.58	221.88	2	12	217.58	207.58
57M-03-06X	220.25	221.87	2	12	218.25	208.25
57M-95-03X	230.80	232.79	7	17	223.80	213.80
57M-95-05X	232.99	235.15	10	20	222.99	212.99
57M-95-06X	232.63	234.39	11.87	21.87	220.76	210.76
57M-95-07X	221.50	222.36	3	13	218.50	208.50
57M-96-10X	226.29	228.75	3	13	223.29	213.29
57M-96-11X	220.04	222.20	2	12	218.04	208.04
57M-96-12X	222.78	225.80	2	12	220.78	210.78
57M-96-13X	223.23	225.58	2	12	221.23	211.23
57P-98-03X	218.62	220.39	2.5	5.5	216.12	213.12
57P-98-04X	218.24	221.75	2	5	216.24	213.24
57WP-05-01	--	--	0*	2*	--	--
57WP-06-02	219.17	220.29	18.92	23.92	200.25	195.25
57WP-06-03	219.31	220.51	13.85	18.85	205.46	200.46
AOC 69W (Annual Sampling)						
69W-94-12	225.65	228.14	3	13	222.65	212.65
69W-94-13	224.50	226.99	3	13	221.50	211.50
69W-94-14	224.73	227.22	3	13	221.73	211.73
69WP-08-01	--	--	10*	13*	--	--
69WP-13-01	--	220.70	10*	13*	--	--
ZWM-01-25X	222.58	224.71	6.13	16.13	216.45	206.45
ZWM-01-26X	224.36	226.81	6.45	16.45	217.91	207.91
ZWM-95-15X	222.14	225.01	5.87	15.87	216.27	206.27
ZWM-95-16X	228.21	227.58	5.67	15.67	222.54	212.54
AOC 69W (Annual Sampling, cont.)						
ZWM-95-17X	235.27	237.83	14.76	24.76	220.51	210.51
ZWM-95-18X	219.93	222.15	5.22	15.22	214.71	204.71
ZWM-99-22X	226.89	226.72	4.6	14.6	222.29	212.29
ZWM-99-23X	223.40	225.08	4.68	14.68	218.72	208.72
ZWM-99-24X	222.83	225.85	5.52	15.52	217.31	207.31
ZWP-95-01X	223.63	226.04	10	12	213.63	211.63
ZWP-95-02X	219.91	222.83	9.5	11.5	210.41	208.41
Willow Brook Piezometer	216.80	218.17	--	--	--	--
AOC 43G (Annual Sampling)						
AAFES-2	299.47	301.72	16.2	31.2	283.27	268.27
AAFES-5	300.01	299.80	15.5	30.5	284.51	269.51
AAFES-6R	296.77	298.74	15	25	281.77	271.77
AAFES-7	256.10	258.80	4.5	14.5	251.60	241.60
XGM-93-02X	309.40	309.01	28	38	281.40	271.40
XGM-94-04X	298.30	300.69	18.2	28.2	280.10	270.10
XGM-94-06X	281.40	284.07	17	27	264.40	254.40
XGM-94-07X	292.20	294.82	17	27	275.20	265.20
XGM-94-08X	296.40	298.98	23.5	33.5	272.90	262.90
XGM-94-10X	299.60	301.96	21.5	31.5	278.10	268.10
XGM-97-12X	309.26	308.70	24	34	285.26	275.26
AOCs 32/43A (Annual Sampling)						
32M-01-13XBR	228.30	257.88	13.7	23.7	244.60	234.60
32M-01-14XBR	254.11	256.06	35.8	45.8	220.30	210.30
32M-01-14XOB	254.30	256.56	17.3	27.3	237.10	227.10
32M-01-15XBR	257.90	258.36	34.5	44.5	223.40	213.40
32M-01-16XBR	257.70	257.50	21	31	236.70	226.70
32M-01-17XBR	256.85	259.11	41.4	51.4	217.71	207.71
32M-01-18XBR	258.61	258.32	14	24	244.60	234.60
32M-92-01X	258.26	260.17	13	23	243.90	233.90
32M-92-03X	258.23	260.02	23.2	33.2	235.00	225.00
32Z-01-05XOB	260.95	261.40	25.5	35.5	235.90	225.90
32Z-01-06XBR	259.82	261.85	16.7	26.7	243.30	233.30
32Z-01-07XOB	257.68	259.48	12.7	22.7	244.98	236.78
32Z-01-08XOB	258.59	260.49	12	22	246.59	238.49
32Z-01-09XOB	257.80	257.37	23.5	33.5	234.30	223.87
32Z-01-10XBR	257.76	257.41	12.5	22.5	245.26	234.91
32Z-01-11XBR	262.07	261.50	8.4	18.4	253.65	243.08
32Z-01-12XBR	258.24	257.85	27.8	37.8	230.46	220.07
32Z-99-02X	257.48	259.71	14.5	29.5	242.98	230.21
43M-01-16XBR	257.04	256.84	47.5	57.5	209.54	199.34
43M-01-16XOB	257.11	256.88	24	34	233.11	222.88

Table 5
Monitoring Wells, Well Points, Piezometers, and Surface Water Locations Selected for Long-Term Monitoring
2022 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Location ID ¹	Ground Surface Elevation	Top of Casing Elevation	Top of Screen Interval	Bottom of Screen Interval	Top of Screen Interval	Bottom of Screen Interval
	(ft NAVD88)	(ft NAVD88)	(ft BGS)	(ft BGS)	(ft NAVD88)	(ft NAVD88)
AOCs 32/43A (Annual Sampling, cont.)						
43M-01-17XBR	258.53	258.29	47.5	57.5	211.03	200.79
43M-01-17XOB	258.51	258.08	23.5	33.5	235.01	224.58
43M-01-20XBR	257.78	257.30	68.3	78.3	189.48	179.00
43M-01-20XOB	257.78	257.40	24	34	233.78	223.40
SHL-15	258.83	258.83	14	24	244.83	234.83
SHL-25	256.28	258.01	23.5	33.5	232.78	224.51
DCL (Semi-Annual Sampling)						
LFM-03-07	315.68	315.14	10.9	20.9	304.78	294.24
LFM-99-01B	326.20	350.67	23.3	32.6	302.90	318.07
LFM-99-02B	353.03	353.83	14.5	23.8	338.53	330.03
LFM-99-03B	341.28	342.08	38.2	47.5	303.08	294.58
LFM-99-05A	315.78	316.58	19.0	28.3	296.78	288.28
LFM-99-05B	315.78	316.58	51.5	55.8	264.28	260.78
LFM-99-06ARP	335.21	337.84	17.5	32.5	317.71	305.34

Notes:

¹ The OB and BR designations associated with the location ID denote overburden and bedrock, respectively.

* = Location not surveyed, values listed in feet below ground surface.

** = Ground surface estimated based on field measurement of stickup casing.

Acronyms and Abbreviations:

AOC = Area of Contamination

COC = chemical of concern

DCL = Devens Consolidation Landfill

DRMO = Defense Reutilization and Marketing

ft = feet

ft BGS = feet below ground surface

Table 6
AOC-Specific Action Levels
2022 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Chemical of Concern	MCP GW-1 ¹ (µg/L)	Background ² (µg/L)	MCL ³ (µg/L)	Cleanup Goal ⁴ (µg/L)	Monitoring Criteria ⁴ (µg/L)	Surface Water Benchmark ⁵ (µg/L)
AOC 57 Area 3 - Building 3713 Fuel Oil Spill Site						
Arsenic, Total	10	10.5	10	10	NS	NS
Arsenic, Dissolved	NS	NS	NS	NS	NS	150
Iron, Dissolved	NS	NS	NS	NS	NS	1,000
AOC 69W - Fort Devens Elementary School Fuel Oil Spill Site						
Arsenic, Dissolved	10	10.5	10	10	NS	NS
Iron, Dissolved	NS	9,100	NS	NS	9,100	NS
Manganese, Dissolved	NS	291	NS	NS	291	NS
EPH⁵						
C9-C18 Aliphatic Hydrocarbons	700	NS	NS	NS	700	NS
C19-C36 Aliphatic Hydrocarbons	14,000	NS	NS	NS	14,000	NS
C11-C22 Aromatic Hydrocarbons	200	NS	NS	NS	200	NS
AOC 43G - Historical Gas Station Motor Pool Fueling Station Site						
Iron, Total	NS	9,100	NS	9,100	NS	NS
Manganese, Total	NS	291	NS	375 ⁷	NS	NS
VOCs						
Benzene	5.0	ND	5.0	5.0	NS	NS
Toluene	1,000	ND	1,000	1,000	NS	NS
Ethylbenzene	700	ND	700	700	NS	NS
Xylenes, Total	10,000	ND	10,000	10,000	NS	NS
VPH⁵						
C5-C8 Aliphatic Hydrocarbons	300	NS	NS	NS	300	NS
C9-C12 Aliphatic Hydrocarbons	700	NS	NS	NS	700	NS
C9-C10 Aromatic Hydrocarbons	200	NS	NS	NS	200	NS
AOCs 32/43A - Former POL Storage Area						
Arsenic, Total	10	10.5	10	10	NS	NS
Manganese, Total	NS	3,500	NS	3,500	NS	NS
VOCs						
Chlorobenzene	100	NS	100	NS	100	NS
Vinyl Chloride	2.0	NS	2.0	2.0	NS	NS
1,2-dichloroethene (trans)	100	NS	100	100	NS	NS
1,2-dichloroethene (cis)	55	NS	70	55	NS	NS
1,1,1-trichloroethane	200	NS	200	NS	5.0	NS
Trichloroethene	5.0	NS	5.0	5.0	NS	NS
1,2-dichlorobenzene	600	NS	600	600	NS	NS
1,3-dichlorobenzene	100	NS	NS	600	NS	NS
1,4-dichlorobenzene	5.0	NS	75	5.0	NS	NS
VPH⁵						
Benzene	5.0	NS	5.0	NS	5.0	NS
Ethylbenzene	700	NS	700	NS	700	NS
Xylenes, total	10,000	NS	10,000	NS	10,000	NS
Toluene	1,000	NS	1,000	NS	1,000	NS
C5-C8 Aliphatic Hydrocarbons	300	NS	NS	NS	300	NS
C9-C12 Aliphatic Hydrocarbons	700	NS	NS	NS	700	NS
C9-C10 Aromatic Hydrocarbons	200	NS	NS	NS	200	NS
EPH⁵						
C9-C18 Aliphatic Hydrocarbons	700	NS	NS	NS	700	NS
C19-C36 Aliphatic Hydrocarbons	14,000	NS	NS	NS	5,000	NS
C11-C22 Aromatic Hydrocarbons	200	NS	NS	NS	200	NS
Devens Consolidation Landfill (DCL) - Landfilling Waste From SAs and AOCs						
VPH⁵						
C5-C8 Aliphatic Hydrocarbons	300	NS	NS	NS	300	NS
C9-C12 Aliphatic Hydrocarbons	700	NS	NS	NS	700	NS
C9-C10 Aromatic Hydrocarbons	200	NS	NS	NS	200	NS
Methyl tert-butyl ether	70	NS	NS	NS	70	NS
Benzene	5.0	NS	5.0	NS	5.0	NS
Toluene	1,000	NS	1,000	NS	1,000	NS
Ethylbenzene	700	NS	700	NS	700	NS
Xylenes, total	10,000	NS	10,000	NS	10,000	NS
Naphthalene	140	NS	NS	NS	140	NS
EPH⁶						
C9-C18 Aliphatic Hydrocarbons	700	NS	NS	NS	700	NS
C19-C36 Aliphatic Hydrocarbons	5,000	NS	NS	NS	5,000	NS
C11-C22 Aromatic Hydrocarbons	200	NS	NS	NS	200	NS
Target PAH Analytes						
2-Methylnaphthalene	10	NS	NS	NS	10	NS
Acenaphthene	20	NS	NS	NS	20	NS
Acenaphthylene	30	NS	NS	NS	30	NS
Anthracene	60	NS	NS	NS	60	NS
Benzo(a)anthracene	1.0	NS	NS	NS	1.0	NS
Benzo(a)pyrene	0.20	NS	0.2	NS	0.2	NS
Benzo(b)fluoranthene	1.0	NS	NS	NS	1.0	NS
Benzo(g,h,i)perylene	50	NS	NS	NS	50	NS
Benzo(k)fluoranthene	1.0	NS	NS	NS	1.0	NS
Chrysene	2.0	NS	NS	NS	2.0	NS

Table 6
AOC-Specific Action Levels
2022 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Chemical of Concern	MCP GW-1 ¹ (µg/L)	Background ² (µg/L)	MCL ³ (µg/L)	Cleanup Goal ⁴ (µg/L)	Monitoring Criteria ⁴ (µg/L)	Surface Water Benchmark ⁵ (µg/L)
Dibenzo(a,h)anthracene	0.50	NS	NS	NS	0.50	NS
Fluoranthene	90	NS	NS	NS	90	NS
Fluorene	30	NS	NS	NS	30	NS
Indeno(1,2,3-cd)pyrene	0.50	NS	NS	NS	0.50	NS
Naphthalene	140	NS	NS	NS	140	NS
Phenanthrene	40	NS	NS	NS	40	NS
Pyrene	60	NS	NS	NS	60	NS
Pesticides						
Hexachlorobenzene	1.0	NS	1.0	NS	1.0	NS
4,4'-DDD (p,p'-DDD)	0.20	NS	NS	NS	0.20	NS
4,4'-DDE (p,p'-DDE)	0.05	NS	NS	NS	0.05	NS
4,4'-DDT (p,p'-DDT)	0.30	NS	NS	NS	0.3	NS
Aldrin	0.50	NS	NS	NS	0.5	NS
alpha-BHC	500	NS	NS	NS	500	NS
beta-BHC	2.0	NS	NS	NS	2.0	NS
delta-BHC	100	NS	NS	NS	100	NS
Dieldrin	0.10	NS	NS	NS	0.10	NS
Endosulfan	10	NS	NS	NS	10	NS
Endrin	2.0	NS	2.0	NS	2.0	NS
Gamma-BHC (Lindane)	0.20	NS	0.20	NS	0.20	NS
Heptachlor	0.40	NS	0.40	NS	0.40	NS
Heptachlor epoxide	0.20	NS	0.20	NS	0.20	NS
Methoxychlor	40	NS	40	NS	40	NS
Total Chlordane	2.0	NS	2.0	NS	2.0	NS
Toxaphene	100	NS	3.0	NS	100	NS
Metals						
Arsenic, Total	10	NS	10	NS	10	NS
Barium, Total	2,000	NS	2,000	NS	2,000	NS
Cadmium, Total	5.0	NS	5.0	NS	5.0	NS
Chromium, Total	100	NS	100	NS	100	NS
Copper, Total	NS	NS	1,300	NS	1,300	NS
Iron, Total	NS	NS	NS	NS	NS	NS
Lead, Total	15	NS	15	NS	15	NS
Manganese, Total	NS	NS	NS	NS	NS	NS
Silver, Total	100	NS	NS	NS	100	NS
Selenium, Total	50	NS	50	NS	50	NS
Mercury, Total	2.0	NS	2.0	NS	2.0	NS
Wet Chemistry						
Solids, Total Dissolved	NS	NS	NS	NS	500,000	NS
Anions						
Chloride	NS	NS	NS	NS	250,000	NS
Sulfate	NS	NS	NS	NS	250,000	NS
Nitrate/Nitrite						
Nitrate/Nitrite (as N)	NS	NS	10,000	NS	10,000	NS
Alkalinity, Total						
As CaCO ₃	NS	NS	NS	NS	NS	NS
Cyanide						
Cyanide, total	200	NS	200	NS	200	NS
COD						
Chemical Oxygen Demand	NS	NS	NS	NS	NS	NS

Notes:

¹ MassDEP MCL GW-1 Standards: 310.CMR 40.0000, 2014.

² Background concentrations determined from selected locations in each AOC.

³ Drinking Water Standards and Health Advisories", Spring 2012, USEPA Office of Water.

⁴ Cleanup goals were established by respective AOC RODs; Monitoring Criteria are used if the ROD did not include cleanup goals for listed analytes.

⁵ USEPA Aquatic Life Water Quality Criterion for Surface Water benchmarks for iron and arsenic (USEPA 2018).

⁶ EPH and VPH concentrations are evaluated against MCP standards for comparison purposes, but the standards are not considered cleanup goals under the ROD.

⁷ Risk-based concentration.

Acronyms and Abbreviations:

µg/L = microgram per liter

AOC = Area of Contamination

COD = chemical oxygen demand

EPH = extractable petroleum hydrocarbon

MassDEP = Massachusetts Department of Environmental Protection

MCL = maximum contaminant level

MCP = Massachusetts Contingency Plan

ND = not detected

NS = no standard

PAH = polycyclic aromatic hydrocarbon

POL = Petroleum, Oils, and Lubricants

ROD = Record of Decision

SA = Study Area

USEPA - United States Environmental Protection Agency

VOC = volatile organic compound

VPH = volatile petroleum hydrocarbon

Table 7
DCL Leachate Discharge Permit No. 17 Limits
2022 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Analytical Fraction	Parameter	Discharge Limitation (mg/L) ^a
Metals Composite	Arsenic	0.20
	Chromium (total)	0.40
	Cadmium	0.045
	Copper	0.75
	Lead	0.20
	Nickel	0.60
	Silver	0.30
	Zinc	0.70
	Mercury	0.001
TSS	Total Suspended Solids	400
TTO	Total Toxic Organics	5.0
pH	pH (units)	5.5 - 9.5
Cyanide	Cyanide (Total)	NL
TPH	Total Petroleum Hydrocarbons	NL
Heptachlor-Pesticide		NL
Phenolics		NL

Notes:

^a = Discharge Limit from Industrial Wastewater Permit No. 17

Acronyms and Abbreviations:

DCL = Devens Consolidation Landfill

mg/L = milligrams per liter

NL = No limit; for monitoring purposes only

PCB = polychlorinated biphenyl

SVOC = semi-volatile organic compound

TPH = total petroleum hydrocarbons

TSS = total suspended solids

TTO = Total toxic organics (sum of VOCs, SVOCs, pesticides, and PCBs)

VOC = volatile organic compound

Table 8
AOC 57 Area 3 Groundwater Analytical Results, Spring 2022
2022 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Analyte	Units	Cleanup Goal ¹	Background ²	Location	57M-96-11X	
				Sample ID	57M-95-03X- SPR22	57M-96-11X- SPR22
				5/4/2022	5/4/2022	5/4/2022
Metals						
Arsenic, Total	µg/L	10	10.5	26	280	290
Iron, Total	µg/L	NS	NS	3,100	43,000	45,000
Manganese, Total	µg/L	NS	NS	140	3,100	3,000
Field Parameters						
Dissolved Oxygen	mg/L	NS	NS	0.58	0.32	--
Oxidation Reduction Potential	mV	NS	NS	-61.3	9.5	--
pH	SU	NS	NS	6.22	5.86	--
Specific Conductivity	mS/cm	NS	NS	0.029	0.124	--
Temperature	°C	NS	NS	9.1	9.1	--
Turbidity	NTU	NS	NS	2.5	183	--

Notes:

30 = Above cleanup goal

-- Not recorded for duplicate sample

¹ Cleanup Goal for arsenic is the MCL standard.

² From the RI. (Final Remediation Investigation Report, Area of Contamination (AOC) 57, Devens, Massachusetts, HLA, 2000b)

Acronyms and Abbreviations:

°C = degrees Celsius

µg/L = microgram per liter

µS/cm = microSiemens per centimeter

AOC = Area of Contamination

MCL = Maximum Contaminant Level

mg/L = milligram per liter

mV = millivolt

NS = no standard

NTU = Nephelometric Turbidity Unit

RI = Remediation Investigation

SU = standard unit

Table 9
AOC 57 Area 3 Surface Water Analytical Results, Spring 2022
2022 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

		Location	57-SW1
		Sample ID	57-SW1-SPR22
Analyte	Units	Surface Water Benchmark ³	5/4/2022
Metals			
Arsenic, Dissolved	µg/L	150	1.3 J
Iron, Dissolved	µg/L	1,000	1,900
Manganese, Dissolved	µg/L	NS	640
Field Parameters			
Dissolved Oxygen	mg/L	NS	0.49
Oxidation Reduction Potential	mV	NS	162.2
pH	SU	NS	5.04
Specific Conductivity	mS/cm	NS	0.138
Temperature	°C	NS	8.6
Turbidity	NTU	NS	245

Notes:

12,000 = Above benchmark
 -- Not recorded for surface water

¹ USEPA Aquatic Life Water Quality Criterion for Surface Water benchmarks for iron and arsenic (USEPA 2018).

Acronyms and Abbreviations:

°C = degrees Celsius

µg/L = microgram per liter

µS/cm = microSiemens per centimeter

AOC = Area of Contamination

mg/L = milligram per liter

mV = millivolt

NS = No Standard

NTU = Nephelometric Turbidity Unit

SU = standard unit

USEPA = United States Environmental Protection Agency

Table 10
AOC 69W Groundwater Analytical Results, Fall 2022
2022 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Analyte	Units	Cleanup Goal ¹	Background ²	Monitoring Criteria ³	Location	69W-94-13	69W-94-14	ZWM-01-25X	ZWM-95-15X	ZWM-95-18X	ZWM-99-22X		ZWM-99-23X	ZWM-99-24X	69WP-08-01	69WP-13-01
					Sample ID	69W-94-13-FAL22	69W-94-14-FAL22	ZWM-01-25X-FAL22	ZWM-95-15X-FAL22	ZWM-95-18X-FAL22	AOC69W-DUP01-FAL22	ZWM-99-22X-FAL22	ZWM-99-23X-FAL22	ZWM-99-24X-FAL22	69WP-08-01-FAL22	69WP-13-01-FAL22
					11/01/2022	11/01/2022	11/01/2022	11/01/2022	11/02/2022	11/01/2022	11/01/2022	11/01/2022	11/01/2022	11/01/2022	11/01/2022	11/01/2022
EPH+PAHs																
C11-C22 Aromatics	µg/L	NS	NS	200	65 U	65 U	72 U	65 U	68 U	68 U	65 U	68 U	65 U	---	---	---
C19-C36 Aliphatics	µg/L	NS	NS	14,000	30 U	30 U	34 U	30 U	32 U	32 U	30 U	32 U	30 U	---	---	---
C9-C18 Aliphatics	µg/L	NS	NS	700	29 U	29 U	32 U	29 U	30 U	30 U	29 U	30 U	29 U	---	---	---
2-Methylnaphthalene	µg/L	NS	NS	NS	1.4 U	1.4 U	1.6 U	1.4 U	1.5 U	1.5 U	1.4 U	1.5 U	1.4 U	---	---	---
Acenaphthene	µg/L	NS	NS	NS	1.4 U	1.4 U	1.6 U	1.4 U	1.5 U	1.5 U	1.4 U	1.5 U	1.4 U	---	---	---
Acenaphthylene	µg/L	NS	NS	NS	1.4 U	1.4 U	1.6 U	1.4 U	1.5 U	1.5 U	1.4 U	1.5 U	1.4 U	---	---	---
Anthracene	µg/L	NS	NS	NS	1.4 U	1.4 U	1.6 U	1.4 U	1.5 U	1.5 U	1.4 U	1.5 U	1.4 U	---	---	---
Benzo(a)anthracene	µg/L	NS	NS	NS	3.8 U	3.8 U	4.2 U	3.8 U	4 U	4 U	3.8 U	4 U	3.8 U	---	---	---
Benzo(a)pyrene	µg/L	NS	NS	NS	4.8 U	4.8 U	5.3 U	4.8 U	5 U	5 U	4.8 U	5 U	4.8 U	---	---	---
Benzo(b)fluoranthene	µg/L	NS	NS	NS	3.8 U	3.8 U	4.2 U	3.8 U	4 U	4 U	3.8 U	4 U	3.8 U	---	---	---
Benzo(g,h,i)perylene	µg/L	NS	NS	NS	4.8 U	4.8 U	5.3 U	4.8 U	5 U	5 U	4.8 U	5 U	4.8 U	---	---	---
Benzo(k)fluoranthene	µg/L	NS	NS	NS	3.8 U	3.8 U	4.2 U	3.8 U	4 U	4 U	3.8 U	4 U	3.8 U	---	---	---
Chrysene	µg/L	NS	NS	NS	3.8 U	3.8 U	4.2 U	3.8 U	4 U	4 U	3.8 U	4 U	3.8 U	---	---	---
Dibenz(a,h)anthracene	µg/L	NS	NS	NS	4.8 U	4.8 U	5.3 U	4.8 U	5 U	5 U	4.8 U	5 U	4.8 U	---	---	---
Fluoranthene	µg/L	NS	NS	NS	3.8 U	3.8 U	4.2 U	3.8 U	4 U	4 U	3.8 U	4 U	3.8 U	---	---	---
Fluorene	µg/L	NS	NS	NS	1.4 U	1.4 U	1.6 U	1.4 U	1.5 U	1.5 U	1.4 U	1.5 U	1.4 U	---	---	---
Indeno(1,2,3-c,d)pyrene	µg/L	NS	NS	NS	4.8 U	4.8 U	5.3 U	4.8 U	5 U	5 U	4.8 U	5 U	4.8 U	---	---	---
Naphthalene	µg/L	NS	NS	NS	1.4 U	1.4 U	1.6 U	1.4 U	1.5 U	1.5 U	1.4 U	1.5 U	1.4 U	---	---	---
Phenanthrene	µg/L	NS	NS	NS	1.4 U	1.4 U	1.6 U	1.4 U	1.5 U	1.5 U	1.4 U	1.5 U	1.4 U	---	---	---
Pyrene	µg/L	NS	NS	NS	3.8 U	3.8 U	4.2 U	3.8 U	4 U	4 U	3.8 U	4 U	3.8 U	---	---	---
Metals																
Arsenic, Dissolved	µg/L	10	10.5	NS	15	3 U	3 U	8.9	3 U	160	170	6.1	3 U	1.1 J	---	---
Iron, Dissolved	µg/L	NS	9,100	9,100	950	39 J	50 U	2,900	50 U	13,000	13,000	820	21 J	19,000	---	---
Manganese, Dissolved	µg/L	NS	291	291	590	27	560	790	15	870	850	220	92	1,400	990	---
Field Parameters																
pH	pH Units	NS	NS	NS	6.50	5.95	6.05	5.77	5.89	---	6.48	6.42	5.63	6.58	6.42	---
Specific Conductivity	mS/cm	NS	NS	NS	1.01	1.14	0.881	1.193	1.113	---	0.738	0.919	0.534	1.04	0.987	---
Turbidity	NTU	NS	NS	NS	40.4	12.5	4.8	12.8	3.5	---	6.6	6.3	1.2	12.0	59.4	---
Dissolved Oxygen	mg/L	NS	NS	NS	1.29	3.11	6.18	1.66	4.47	---	1.38	1.85	2.47	1.04	1.21	---
Temperature	°C	NS	NS	NS	16.1	15.0	15.5	13.9	15.2	---	16.6	14.9	15.2	15.0	14.8	---
Oxidation Reduction Potential	mV	NS	NS	NS	17.9	236.0	145.6	94.1	229.7	---	-74.9	54.4	200.2	-64.0	-91.7	---

Notes:

- 100 = Above cleanup goal
- 100 = Above background and/or monitoring criteria

¹ Cleanup Goal for arsenic is the MCL standard.
² Monitoring criteria for iron and manganese are background levels from the RI (Final Remediation Investigation Report, Area of Contamination (AOC) 57, Devens, Massachusetts, HLA, 2000b).
³ EPH MassDEP concentrations are evaluated against Massachusetts Contingency Plan standards for comparison purposes.

Acronyms and Abbreviations:

- °C = degrees Celsius
- µg/L = microgram per liter
- µS/cm = microSiemens per centimeter
- AOC = Area of Contamination
- EPH = extractable petroleum hydrocarbon
- J = Estimated result
- MassDEP = Massachusetts Department of Environmental Protection
- MCL = Maximum Contaminant Level
- mg/L = milligram per liter

Table 11
AOC 43G Groundwater Analytical Results, Fall 2022
2022 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Analyte	Units	Cleanup Goal ¹	Background ²	Monitoring Criteria ³	Location	AAFES-2	XGM-93-02X	XGM-94-04X	XGM-97-12X		AAFES-7
					Sample ID	AAFES-2-FAL22	XGM-93-02X-FAL22	XGM-94-04X-FAL22	AOC43G-DUP01-FAL22	XGM-97-12X-FAL22	AAFES-7-FAL22
					10/31/2022	10/31/2022	10/31/2022	10/31/2022	10/31/2022	10/31/2022	
General Chemistry											
Alkalinity, Total (as CaCO ₃)	mg/L	NS	NS	NS	140 J	180 J	170 J	180 J	180 J	---	---
Metals											
Iron, Total	µg/L	9,100	9,100	NS	14,000	4,400	4,800 J	16,000	16,000	---	---
Manganese, Total	µg/L	375	291	NS	2,600	1,000	5,600	1,100	1,100	77	77
VPH											
Benzene	µg/L	5	NS	NS	1 U	1 U	1 U	1 U	1 U	---	---
C5-C8 Aliphatics	µg/L	NS	NS	300	610	110	260	190 J	190 J	---	---
C9-C10 Aromatics	µg/L	NS	NS	200	530	100 U	190	160	160	---	---
C9-C12 Aliphatics	µg/L	NS	NS	700	1,100	100 U	370	500 U	500 U	---	---
Ethylbenzene	µg/L	700	NS	NS	11	1 U	8.9	1 U	1 U	---	---
m,p-Xylene	µg/L	10,000	NS	NS	1 U	1 U	1 U	1 U	1 U	---	---
Methyl tert-butyl ether (MTBE)	µg/L	NS	NS	NS	1 U	4.9 J	1 U	1 U	1 U	---	---
Naphthalene	µg/L	NS	NS	NS	9.5	1 U	1 U	1 U	1 U	---	---
o-Xylene	µg/L	10,000	NS	NS	1 U	1 U	1 U	1 U	1 U	---	---
Toluene	µg/L	1,000	NS	NS	1 U	1 U	1 U	1 U	1 U	---	---
Field Parameters											
pH	pH Units	NS	NS	NS	6.79	6.49	7.28	---	6.75	6.38	6.38
Specific Conductivity	mS/cm	NS	NS	NS	1.74	1.2	1.71	---	1.43	2.1	2.1
Turbidity	NTU	NS	NS	NS	3.9	13.1	4.5	---	1.75	4.88	4.88
Dissolved Oxygen	mg/L	NS	NS	NS	0.54	1.08	0.71	---	0.94	6.85	6.85
Temperature	°C	NS	NS	NS	16.4	14.4	14.6	---	14.8	14	14
Oxidation Reduction Potential	mV	NS	NS	NS	-105.9	-24.4	-138.5	---	-110	179.6	179.6

Notes:

- 990 = Above cleanup goal
- 990 = Above background and/or monitoring criteria

¹ The cleanup goal for iron is the background level. The cleanup goal for manganese is a site-specific goal established as part of the long-term monitoring plan for the site (Long-Term Monitoring Plan Former Fort Devens Army Installation, HGL, 2008). Benzene, ethylbenzene, xylenes, and toluene are not contaminants of concern but the cleanup goals are the Maximum Contaminant Levels (MCLs).

² The monitoring criteria for iron and manganese is the background from the RI (Final Remedial Investigation Report Area of Contamination (AOC) 43G, ABB Environmental Services, Inc., 1996). The monitoring criterion for arsenic is the MCL.

³ The VPH carbon ranges are not contaminants of concern and are evaluated against Massachusetts Contingency Plan GW-1 standards for comparison purposes.

Acronyms and Abbreviations:

- °C = degrees Celsius
- µg/L = microgram per liter
- µS/cm = microSiemen per centimeter
- AOC = Area of Contamination
- J = Estimated result
- MCL = Maximum Contaminant Level
- mg/L = milligram per liter
- mV = millivolt
- NS = no standard
- NTU = Nephelometric Turbidity Unit
- RI = Remedial Investigation
- U = Non-detect
- VPH = volatile petroleum hydrocarbon

Table 12
AOCs 32/43A Groundwater Analytical Results, Spring 2022
2022 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Analyte	Units	Cleanup Goal ¹	Monitoring Criteria	Location	32M-01-13XBR	32M-01-14XOB	32M-01-17XBR	32M-01-18XBR	
				Sample ID	32M-01-13XBR-SPR22	32M-01-14XOB-SPR22	32M-01-17XBR-SPR22	32M-01-18XBR-SPR22	AOC32-DUP01-SPR22
				05/03/2022	05/03/2022	05/03/2022	05/03/2022		
Metals									
Arsenic, Total	µg/L	10	--	3 U	29	1.3 J	2.3 J	2.1 J	
Manganese, Total	µg/L	3,500	--	6.7 J	770	39	1,700 J	1,200 J	
VOCs									
1,1,1,2-Tetrachloroethane	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	µg/L	--	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	µg/L	--	5	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloropropene	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene	µg/L	--	--	2 U	2 U	2 U	2 U	2 U	2 U
1,2,3-Trichloropropane	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-Trichlorobenzene	µg/L	--	--	2 U	2 U	2 U	2 U	2 U	2 U
1,2,4-Trimethylbenzene	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	µg/L	--	--	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dibromoethane (EDB)	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	µg/L	600	--	1 U	1 U	1 U	160	180	
1,2-Dichloroethane	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethene	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	µg/L	--	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3,5-Trimethylbenzene	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	µg/L	100	--	1 U	0.43 J	1 U	27	31	
1,3-Dichloropropane	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	µg/L	5	--	1 U	1 U	1 U	18	22	
2,2-Dichloropropane	µg/L	--	--	1 U	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
2-Butanone (MEK)	µg/L	--	--	20 U	20 U	20 U	20 U	20 U	20 U
2-Chlorotoluene	µg/L	--	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Hexanone	µg/L	--	--	10 U	10 U	10 U	10 U	10 U	10 U
4-Chlorotoluene	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
4-Methyl-2-pentanone (MIBK)	µg/L	--	--	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	µg/L	--	--	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	µg/L	--	5	1 U	1 U	1 U	0.28 J	0.3 J	
Bromobenzene	µg/L	--	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromochloromethane	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	µg/L	--	--	2 U	2 U	2 U	2 U	2 U	2 U
Bromomethane	µg/L	--	--	10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
Carbon tetrachloride	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	µg/L	--	100	0.5 U	0.5 U	0.5 U	160	180	
Chloroethane	µg/L	--	--	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
Chloromethane	µg/L	--	--	2 U	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ
cis-1,2-Dichloroethene	µg/L	55	--	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
Dibromomethane	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
Dichlorodifluoromethane	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	µg/L	--	700	1 U	1 U	1 U	1 U	1 U	1 U
Hexachlorobutadiene	µg/L	--	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene (Cumene)	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
m,p-Xylene	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
Methyl tert-butyl ether (MTBE)	µg/L	--	--	2 U	2 U	2 U	2 U	2 U	2 U
Methylene chloride	µg/L	--	--	10 U	10 U	10 U	10 U	10 U	10 U
n-Butylbenzene	µg/L	--	--	2 U	2 U	2 U	2 U	2 U	2 U
n-Propylbenzene	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
Naphthalene	µg/L	--	--	5 U	5 U	5 U	5 U	5 U	5 U
o-Xylene	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
p-Cymene (p-Isopropyltoluene)	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
sec-Butylbenzene	µg/L	--	--	2 U	2 U	2 U	2 U	2 U	2 U
Styrene	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
tert-Butylbenzene	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene (PCE)	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	µg/L	1,000	--	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	µg/L	100	--	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene (TCE)	µg/L	5	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichlorofluoromethane	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
Vinyl acetate	µg/L	--	--	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ
Vinyl chloride	µg/L	--	2	1 U	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	µg/L	--	--	1 U	1 U	1 U	1 U	1 U	1 U
VPH									
Benzene	µg/L	--	5	2 U	2 U	2 U	2 U	2 U	2 U
C5-C8 Aliphatics	µg/L	--	300	75 U	75 U	75 U	75 U	75 U	75 U
C9-C10 Aromatics	µg/L	--	200	75 U	75 U	75 U	210	200	
C9-C12 Aliphatics	µg/L	--	700	75 U	75 U	75 U	75 U	75 U	75 U
Ethylbenzene	µg/L	--	700	3.8 U	3.8 U	3.8 U	220	210	
m,p-Xylene	µg/L	--	10,000	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U
Methyl tert-butyl ether (MTBE)	µg/L	--	--	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
Naphthalene	µg/L	--	--	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
o-Xylene	µg/L	--	10,000	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
Toluene	µg/L	--	1,000	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U

Table 12
AOCs 32/43A Groundwater Analytical Results, Spring 2022
2022 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Analyte	Units	Cleanup Goal ¹	Monitoring Criteria	Location	32M-01-13XBR	32M-01-14XOB	32M-01-17XBR	32M-01-18XBR	
				Sample ID	32M-01-13XBR-SPR22	32M-01-14XOB-SPR22	32M-01-17XBR-SPR22	32M-01-18XBR-SPR22	AOC32-DUP01-SPR22
				05/03/2022	05/03/2022	05/03/2022	05/03/2022		
Field Parameters									
Dissolved Oxygen	mg/L	--	--	6.67	1.05	0.61	4.33	4.33	
Oxidation Reduction Potential	mV	--	--	137.7	4.8	34.2	137	137	
pH	SU	--	--	6.51	6.15	7.1	6.54	6.54	
Specific Conductivity	mS/cm	--	--	2.263	0.482	0.107	2.93	2.93	
Temperature	°C	--	--	13.2	11.4	15.1	12.5	12.5	
Turbidity	NTU	--	--	7.13	8.2	39.2	2.31	2.31	

Notes:

50	= Above cleanup goal
50	= Above monitoring criteria

-- = not sampled

¹ The cleanup goal for arsenic and select VOCs is the MCL; the cleanup goal for manganese is the background level.

² The OB and BR designations associated with the well identification denote overburden and bedrock, respectively.

³ VPH carbon range concentrations are evaluated against MassDEP standards for comparison purposes.

⁴ The monitoring criteria for total xylenes is 10,000 µg/L.

Acronyms and Abbreviations:

°C = degrees Celsius	mV = millivolt
µg/L = microgram per liter	NTU = Nephelometric Turbidity Unit
µS/cm = microSiemen per centimeter	SU = standard unit
AOC = Area of Contamination	U = Non-detect
J = Estimated result	UJ = Estimated non-detect because of QC outliers.
MassDEP = Massachusetts Department of Environmental Protection	VOC = volatile organic compound
MCL = maximum contaminant level	VPH = volatile petroleum hydrocarbon
mg/L = milligram per liter	

Table 13
DCL Groundwater Analytical Results, Spring 2022
2022 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Analyte	Units	Monitoring Criteria ¹	Location	LFM-03-07	LFM-99-02B	LFM-99-05A		LFM-99-06A-RP
			Sample ID	LFM-03-07-SPR22	LFM-99-02B-SPR22	LFM-99-05A-SPR22	DCL-DUP01-SPR22	LFM-99-06A-RP-SPR22
				05/04/2022	05/04/2022	05/05/2022	05/05/2022	05/04/2022
EPH+PAHs								
2-Methylnaphthalene	µg/L	NS		1.5 U	1.4 U	1.4 UJ	---	1.5 U
Acenaphthene	µg/L	NS		1.9 U	1.8 U	1.8 UJ	---	1.9 U
Acenaphthylene	µg/L	NS		1.5 U	1.4 U	1.4 UJ	---	1.5 U
Anthracene	µg/L	NS		1.5 U	1.4 U	1.4 UJ	---	1.5 U
Benzo(a)anthracene	µg/L	NS		1.5 U	1.4 U	1.4 UJ	---	1.5 U
Benzo(a)pyrene	µg/L	NS		1.5 U	1.4 U	1.4 UJ	---	1.5 U
Benzo(b)fluoranthene	µg/L	NS		1.5 U	1.4 U	1.4 UJ	---	1.5 U
Benzo(g,h,i)perylene	µg/L	NS		1.5 U	1.4 U	1.4 UJ	---	1.5 U
Benzo(k)fluoranthene	µg/L	NS		1.5 U	1.4 U	1.4 UJ	---	1.5 U
C11-C22 Aromatics	µg/L	200		74 U	71 U	72 UJ	---	74 U
C19-C36 Aliphatics	µg/L	14,000		74 U	71 U	72 UJ	---	74 U
C9-C18 Aliphatics	µg/L	700		74 U	71 U	72 UJ	---	74 U
Chrysene	µg/L	NS		1.5 U	1.4 U	1.4 UJ	---	1.5 U
Dibenz(a,h)anthracene	µg/L	NS		1.5 U	1.4 U	1.4 UJ	---	1.5 U
Fluoranthene	µg/L	NS		1.5 U	1.4 U	1.4 UJ	---	1.5 U
Fluorene	µg/L	NS		1.5 U	1.4 U	1.4 UJ	---	1.5 U
Indeno(1,2,3-c,d)pyrene	µg/L	NS		1.5 U	1.4 U	1.4 UJ	---	1.5 U
Naphthalene	µg/L	NS		1.5 U	1.4 U	1.4 UJ	---	1.5 U
Phenanthrene	µg/L	NS		1.5 U	1.4 U	1.4 UJ	---	1.5 U
Pyrene	µg/L	NS		1.5 U	1.4 U	1.4 UJ	---	1.5 U
General Chemistry								
Alkalinity, Total (as CaCO3)	mg/L	NS		97	69	97	95	89
Chemical Oxygen Demand	mg/L	NS		20 U	10 J	20 U	20 U	20 U
Chloride	mg/L	NS		190	170 J	130	130	220
Cyanide	mg/L	0.20		0.0091 J	0.0074 J	0.0054 J	0.0053 J	0.007 J
Nitrate-Nitrite (as N)	mg/L	NS		1.3	0.38	0.41	0.4	0.9
Sulfate	mg/L	NS		24	12	15	15	23
Total Dissolved Solids	mg/L	NS		460	370	360	360	500
Metals								
Arsenic, Total	µg/L	10		3 U	3 U	0.96 J	3 U	3 U
Barium, Total	µg/L	2,000		12 J	72 J	12 J	11 J	5 J
Cadmium, Total	µg/L	5		1 U	1 U	1 U	1 U	1 U
Chromium, Total	µg/L	100		5 U	5 U	5 U	5 U	5 U
Copper, Total	µg/L	1,300		10 U	10 U	10 U	10 U	10 U
Iron, Total	µg/L	NS		45 J	50 U	290 J	50 UJ	50 U
Lead, Total	µg/L	15		10 U	10 U	10 U	10 U	10 U
Manganese, Total	µg/L	NS		5 U	5 U	5 U	5 U	5 U
Mercury, Total	µg/L	50		0.2 U	0.2 UJ	0.2 U	0.2 U	0.2 U
Selenium, Total	µg/L	100		20 U	20 U	20 U	20 U	20 U
Silver, Total	µg/L	2		5 U	5 U	5 U	5 U	5 U
Pesticides								
Aldrin	µg/L	NS		0.0072 U	0.0074 UJ	0.0078 U	0.0073 U	0.0074 U
alpha-BHC (alpha-Hexachlorocyclohexane)	µg/L	NS		0.0048 U	0.0049 UJ	0.0052 U	0.0048 U	0.005 U
alpha-Endosulfan	µg/L	NS		0.0048 U	0.0049 U	0.0052 U	0.0048 U	0.005 U
beta-BHC (beta-Hexachlorocyclohexane)	µg/L	NS		0.0096 U	0.0098 U	0.01 U	0.0097 U	0.0099 U
beta-Endosulfan	µg/L	NS		0.0048 U	0.0049 U	0.0052 U	0.0048 U	0.005 U
Chlordane	µg/L	NS		0.13 U	0.14 U	0.15 U	0.14 U	0.14 U
delta-BHC (delta-Hexachlorocyclohexane)	µg/L	NS		0.0096 U	0.0098 U	0.01 U	0.0097 U	0.0099 U
Dieldrin	µg/L	NS		0.0048 U	0.0049 U	0.0052 U	0.0048 U	0.005 U
Endosulfan sulfate	µg/L	NS		0.0072 U	0.0074 U	0.0078 U	0.0073 U	0.0074 U
Endrin	µg/L	NS		0.0072 U	0.0074 U	0.0078 U	0.0073 U	0.0074 U
Endrin aldehyde	µg/L	NS		0.0072 U	0.0074 U	0.0078 U	0.0073 U	0.0074 U
Endrin ketone	µg/L	NS		0.0048 U	0.0049 U	0.0052 U	0.0048 U	0.005 U
gamma-BHC (Lindane)	µg/L	NS		0.0048 U	0.0049 UJ	0.0052 U	0.0048 U	0.005 U
Heptachlor	µg/L	NS		0.0072 U	0.0074 UJ	0.0078 U	0.0073 U	0.0074 U
Heptachlor epoxide	µg/L	NS		0.0048 U	0.0049 U	0.0052 U	0.0048 U	0.005 U
Methoxychlor	µg/L	NS		0.0096 U	0.0098 U	0.01 U	0.0097 U	0.0099 U
p,p'-DDD	µg/L	NS		0.0072 U	0.0074 U	0.0078 U	0.0073 U	0.0074 U
p,p'-DDE	µg/L	NS		0.0072 U	0.0074 UJ	0.0078 U	0.0073 U	0.0074 U
p,p'-DDT	µg/L	0.30		0.0072 U	0.0074 U	0.0078 U	0.0073 U	0.0074 U
Toxaphene	µg/L	NS		0.54 U	0.55 U	0.58 U	0.54 U	0.56 U
VPH+BTEX								
Benzene	µg/L	NS		2 U	2 UJ	2 U	2 U	2 U
C5-C8 Aliphatics	µg/L	300		75 U	75 UJ	75 U	75 U	75 U
C9-C10 Aromatics	µg/L	200		75 U	75 U	75 U	75 U	75 U
C9-C12 Aliphatics	µg/L	700		75 U	75 UJ	75 U	75 U	75 U
Ethylbenzene	µg/L	700		3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
m,p-Xylene	µg/L	10,000		7.5 U	7.5 U	7.5 U	7.5 U	7.5 U
Methyl tert-butyl ether (MTBE)	µg/L	70		3.8 U	3.8 UJ	3.8 U	3.8 U	3.8 U
Naphthalene	µg/L	140		3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
o-Xylene	µg/L	10,000		3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
Toluene	µg/L	1,000		3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
Field Parameters								
Dissolved Oxygen	mg/L	NS		8.04	8.85	3.06	---	6.79
Oxidation Reduction Potential	mV	NS		182	253.9	195.4	---	168
pH	SU	NS		6.33	6.04	6.33	---	6.37
Specific Conductivity	mS/cm	NS		0.71	0.502	0.091	---	0.82
Temperature	°C	NS		9.7	9	11.3	---	10.5
Turbidity	NTU	NS		0.83	1.08	17.2	---	1.18

Notes:
-- = not analyzed

¹ Monitoring Criteria are equal to the MassDEP MCL GW-1 standards (310 CMR 40.0000, 2014) and/or the Drinking Water Standards and Health Advisories (USEPA Office of Water, 2012).

Acronyms and Abbreviations:

°C = degrees Celsius
µg/L = microgram per liter
µS/cm = microsiemens per centimeter
BTEX = benzene, toluene, ethylbenzene, and xylenes
DCL = Devens Consolidation Landfill
EPH = extractable petroleum hydrocarbon
J = Estimated Result
mg/L = milligram per liter

mV = millivolts
NS = No Standard
NTU = Nephelometric Turbidity Unit
PAH = polycyclic aromatic hydrocarbon
R = Data were rejected.
SU = Standard Unit
U = The target analyte was not detected at or above the laboratory reporting limit.
UJ = Estimated non-detect because of QC outliers.

Table 14
DCL Groundwater Analytical Results, Fall 2022
2022 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Analyte	Units	Monitoring Criteria	Location	LFM-99-02B		LFM-99-05A		LFM-99-06A-RP
			Sample ID	LFM-99-02B-FAL22	DCL-DUP01-FAL22	LFM-99-05A-FAL22	LFM-99-06A-RP-FAL22	
			10/27/2022	10/27/2022		10/27/2022		10/27/2022
EPH+PAHs								
C11-C22 Aromatics	µg/L	200	1.4 U	1.4	U	1.4 U		1.4 U
C19-C36 Aliphatics	µg/L	14,000	1.4 U	1.4	U	1.4 U		1.4 U
C9-C18 Aliphatics	µg/L	700	1.4 U	1.4	U	1.4 U		1.4 U
2-Methylnaphthalene	µg/L	NS	1.4 U	1.4	U	1.4 U		1.4 U
Acenaphthene	µg/L	NS	3.8 U	3.8	U	3.8 U		3.8 U
Acenaphthylene	µg/L	NS	4.8 U	4.8	U	4.8 U		4.8 U
Anthracene	µg/L	NS	3.8 U	3.8	U	3.8 U		3.8 U
Benzo(a)anthracene	µg/L	NS	4.8 U	4.8	U	4.8 U		4.8 U
Benzo(a)pyrene	µg/L	NS	3.8 U	3.8	U	3.8 U		3.8 U
Benzo(b)fluoranthene	µg/L	NS	65 U	65	U	65 U		65 U
Benzo(g,h,i)perylene	µg/L	NS	30 U	30	U	30 U		30 U
Benzo(k)fluoranthene	µg/L	NS	29 U	29	U	29 U		29 U
Chrysene	µg/L	NS	3.8 U	3.8	U	3.8 U		3.8 U
Dibenz(a,h)anthracene	µg/L	NS	4.8 U	4.8	U	4.8 U		4.8 U
Fluoranthene	µg/L	NS	3.8 U	3.8	U	3.8 U		3.8 U
Fluorene	µg/L	NS	1.4 U	1.4	U	1.4 U		1.4 U
Indeno(1,2,3-c,d)pyrene	µg/L	NS	4.8 U	4.8	U	4.8 U		4.8 U
Naphthalene	µg/L	NS	1.4 UJ	1.4	U	1.4 U		1.4 U
Phenanthrene	µg/L	NS	1.4 U	1.4	U	1.4 U		1.4 U
Pyrene	µg/L	NS	3.8 U	3.8	U	3.8 U		3.8 U
General Chemistry								
Alkalinity, Total (as CaCO3)	mg/L	NS	120 J	81	J	82 J		120 J
Chemical Oxygen Demand	mg/L	NS	14 J	17	J	16 J		15 J
Chloride	mg/L	NS	150	280		270		270
Cyanide	mg/L	0.20	0.0064 J	0.012		0.005 U		0.0035 J
Nitrate-Nitrite (as N)	mg/L	NS	0.53	0.46		0.33		0.73
Sulfate	mg/L	NS	17	14		16		24
Total Dissolved Solids	mg/L	NS	390	620		610		600
Metals								
Arsenic, Total	µg/L	10	3 U	3	U	1.2 J		3 U
Barium, Total	µg/L	2,000	10 U	23		21		10 U
Cadmium, Total	µg/L	5	1 U	1	U	1 U		1 U
Chromium, Total	µg/L	100	4 U	4	U	4 U		4 U
Copper, Total	µg/L	1,300	10 U	10	U	10 U		10 U
Iron, Total	µg/L	NS	50 U	50	U	50 U		50 U
Lead, Total	µg/L	15	20 U	20	U	20 U		20 U
Manganese, Total	µg/L	NS	5 U	5	U	5 U		5 U
Mercury, Total	µg/L	50	0.2 U	0.2	U	0.2 U		0.2 U
Selenium, Total	µg/L	100	20 U	20	U	20 U		20 U
Silver, Total	µg/L	2	5 U	5	U	5 U		5 U
Pesticides								
Aldrin	µg/L	NS	0.0037 U	0.0042	U	0.0037 U		0.0036 U
alpha-BHC (alpha-Hexachlorocyclohexane)	µg/L	NS	0.0037 U	0.0042	U	0.0037 U		0.0036 U
alpha-Endosulfan	µg/L	NS	0.0037 U	0.0042	U	0.0037 U		0.0036 U
beta-BHC (beta-Hexachlorocyclohexane)	µg/L	NS	0.0037 U	0.0042	U	0.0037 U		0.0036 U
beta-Endosulfan	µg/L	NS	0.0037 U	0.0042	U	0.0037 U		0.0036 U
Chlordane	µg/L	NS	0.37 U	0.42	U	0.37 U		0.36 U
delta-BHC (delta-Hexachlorocyclohexane)	µg/L	NS	0.0037 U	0.0042	U	0.0037 U		0.0036 U
Dieldrin	µg/L	NS	0.0037 U	0.0042	U	0.0037 U		0.0036 U
Endosulfan sulfate	µg/L	NS	0.0037 U	0.0042	U	0.0037 U		0.0036 U
Endrin	µg/L	NS	0.0037 U	0.0042	U	0.0037 U		0.0036 U
Endrin aldehyde	µg/L	NS	0.015 U	0.017	U	0.015 U		0.015 U
Endrin ketone	µg/L	NS	0.015 U	0.017	U	0.015 U		0.015 U
gamma-BHC (Lindane)	µg/L	NS	0.0037 U	0.0042	U	0.0037 U		0.0036 U
Heptachlor	µg/L	NS	0.0037 UJ	0.0042	UJ	0.0037 UJ		0.0036 UJ
Heptachlor epoxide	µg/L	NS	0.0037 U	0.0042	U	0.0037 U		0.0036 U
Methoxychlor	µg/L	NS	0.0037 U	0.0042	U	0.0037 U		0.0036 U
p,p'-DDD	µg/L	NS	0.0037 U	0.0042	U	0.0037 U		0.0036 U
p,p'-DDE	µg/L	NS	0.0037 U	0.0042	U	0.0037 U		0.0036 U
p,p'-DDT	µg/L	0.30	0.0037 U	0.0042	U	0.0037 U		0.0036 U
Toxaphene	µg/L	NS	0.74 U	0.84	U	0.74 U		0.73 U
VPH+BTEX								
C5-C8 Aliphatics	µg/L	300	3 U	3	U	3 U		3 U
C9-C10 Aromatics	µg/L	200	1 U	1	U	1 U		1 U
C9-C12 Aliphatics	µg/L	700	3 U	3	U	3 U		3 U
Benzene	µg/L	NS	1 U	1	U	1 U		1 U
Ethylbenzene	µg/L	700	1 U	1	U	1 U		1 U
m,p-Xylene	µg/L	10,000	1 U	1	U	1 U		1 U
Methyl tert-butyl ether (MTBE)	µg/L	70	1 U	1	U	1 U		1 U
Naphthalene	µg/L	140	1 U	1	U	1 U		1 U
o-Xylene	µg/L	10,000	1 U	1	U	1 U		1 U
Toluene	µg/L	1,000	1 U	1	U	1 U		1 U
Field Parameters								
pH	SU	NS	6.48	---		6.18		6.42
Specific Conductivity	mS/cm	NS	0.753	---		1.18		0.742
Turbidity	NTU	NS	2.7	---		5.56		4.53
Dissolved Oxygen	mg/L	NS	8.68	---		5.86		6.57
Temperature	°C	NS	11.8	---		13.8		14.6
Oxidation Reduction Potential	mV	NS	230.9	---		244.4		102.9

Notes:
-- = not analyzed

Acronyms and Abbreviations:

°C = degrees Celsius
µg/L = microgram per liter
µS/cm = microsiemens per centimeter
BTEX = benzene, toluene, ethylbenzene, and xylenes
DCL = Devens Consolidation Landfill
EPH = extractable petroleum hydrocarbon
J = Estimated Result
mg/L = milligram per liter

mV = millivolts
NS = No Standard
NTU = Nephelometric Turbidity Unit
PAH = polycyclic aromatic hydrocarbon
R = Data were rejected.
SU = Standard Unit
U = The target analyte was not detected at or above the laboratory reporting limit.
UJ = Estimated non-detect because of QC outliers.

Table 15
DCL Leachate Analytical Results, Fall 2022
2022 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

MassDevelopment Industrial Wastewater Discharge Permit No. 017 (Summary)			
Analytical Fraction	Parameter	Discharge Limitation (µg/L) ^a	Annual Sampling Event
			Date Sampled: 10/17/2022
			Concentrations (µg/L)
Metals composite	Arsenic	200	4.2 J
	Cadmium	45	1.0 U
	Chromium	400	4.0 U
	Copper	750	10 U
	Lead	200	20 U
	Nickel	600	10 U
	Silver	300	5.0 U
	Zinc	700	20 U
	Mercury	1	0.20 U
TTO	Total Toxic Organics	5,000	0.7819 J
TSS	Total Suspended Solids	400,000	21,000
Cyanide	Cyanide (total)	NL	13
TPH	TPH (DRO)	NL	150 U
Phenols	Phenols (total)	NL	50 U
pH <i>grab sample</i>	pH (units)	5.5 – 9.5	6.4

Notes:

^a = Discharge Limit from Industrial Wastewater Permit No. 17

Abbreviations:

°C = degrees Celsius

µg/L = milligrams per liter

DCL = Devens Consolidation Landfill

J = Estimated result

NL = No limit

TPH (DRO) = Total Petroleum Hydrocarbons (Diesel-Range Organics)

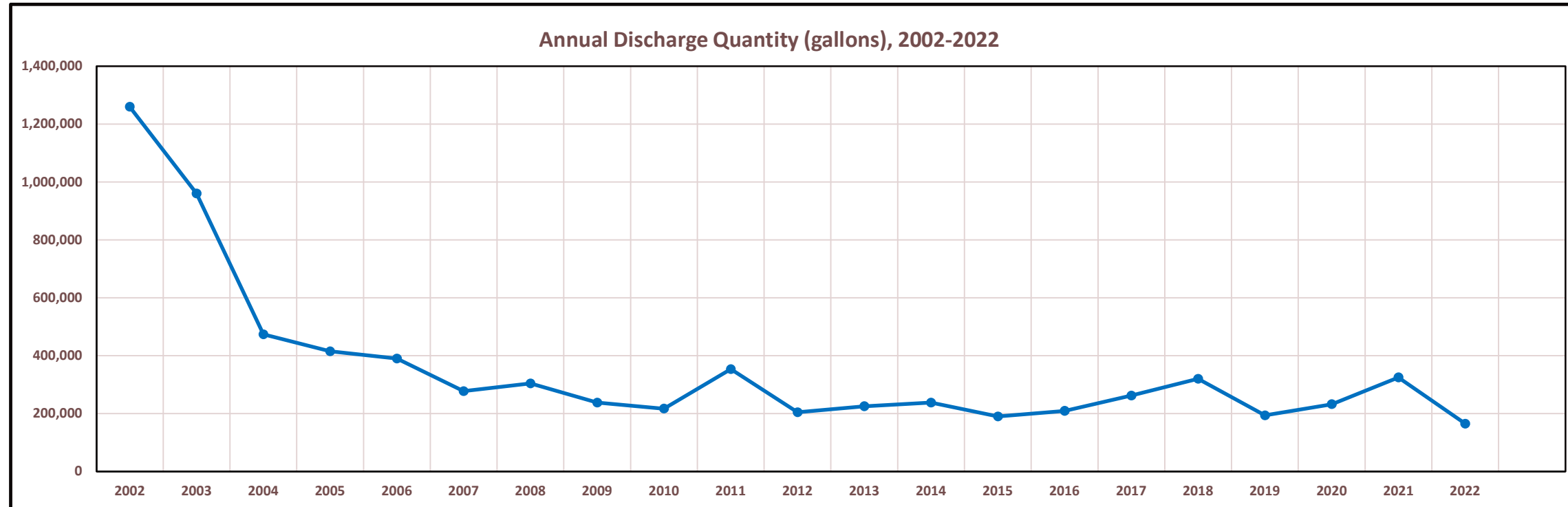
TSS = Total Suspended Solids

TTO = Total Toxic Organics (sum of VOCs, SVOCs, pesticides, and PCBs)

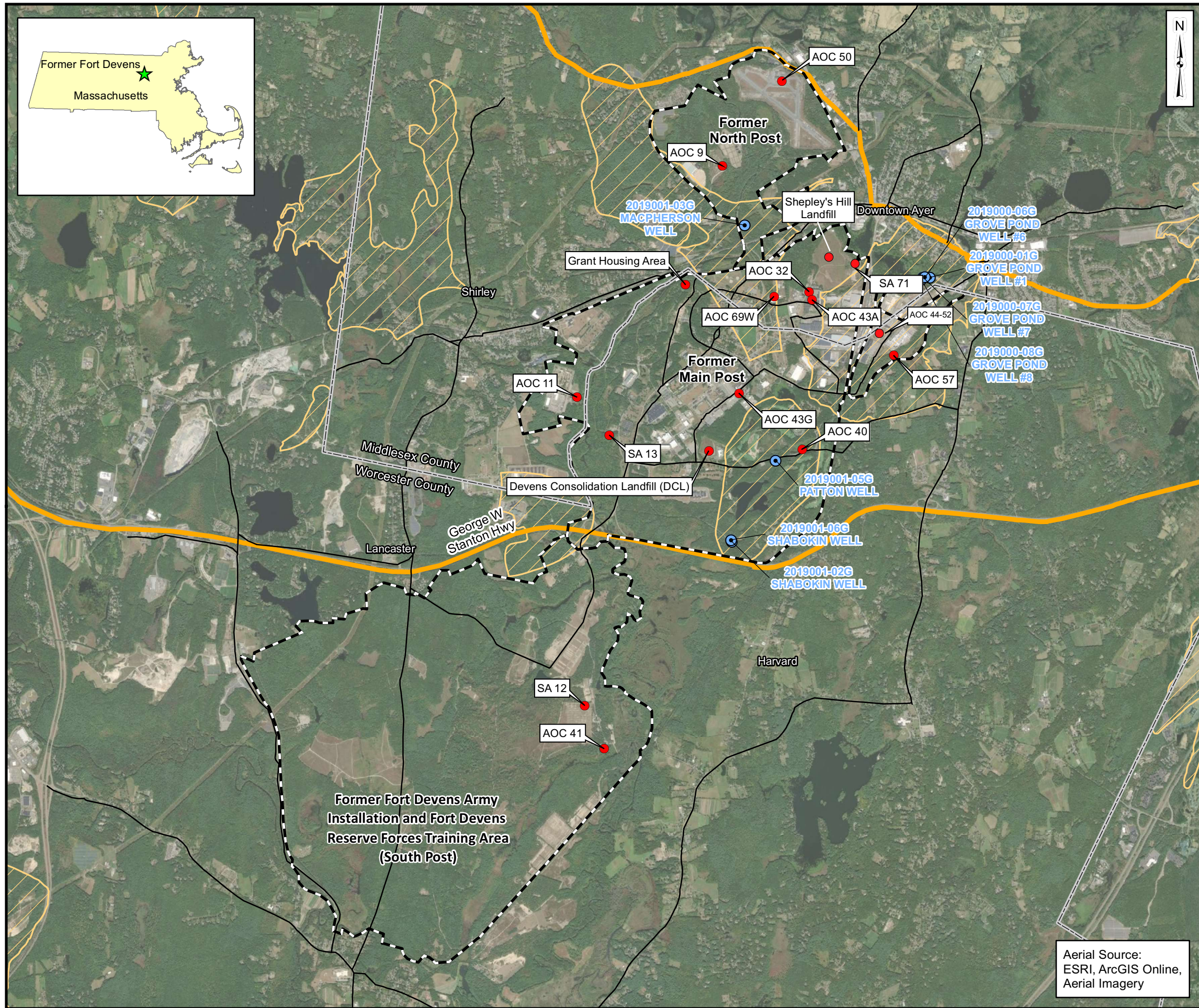
U = The target analyte was not detected at or above the indicated laboratory reporting limit.

Table 16
DCL Leachate Annual Discharge Quantities
2022 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts

Period	Discharge Quantities (Gallons)																				
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Annual Total	1,259,866	960,394	473,802	414,858	390,085	277,626	304,547	237,983	217,155	353,618	204,483	225,768	237,752	190,403	209,849	261,989	320,357	193,649	232,469	325,249	165,191
Total Leachate Discharge Quantity (2002-2022) =																				7,457,093	



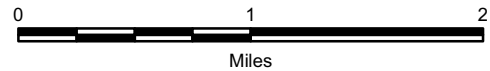
Figures



Legend

- Former Fort Devens Boundary
- Area of Contamination (AOC)
- Water Supply Well
- County Line
- Highway
- Major Road
- MassDEP Zone II Wellhead Protection Area

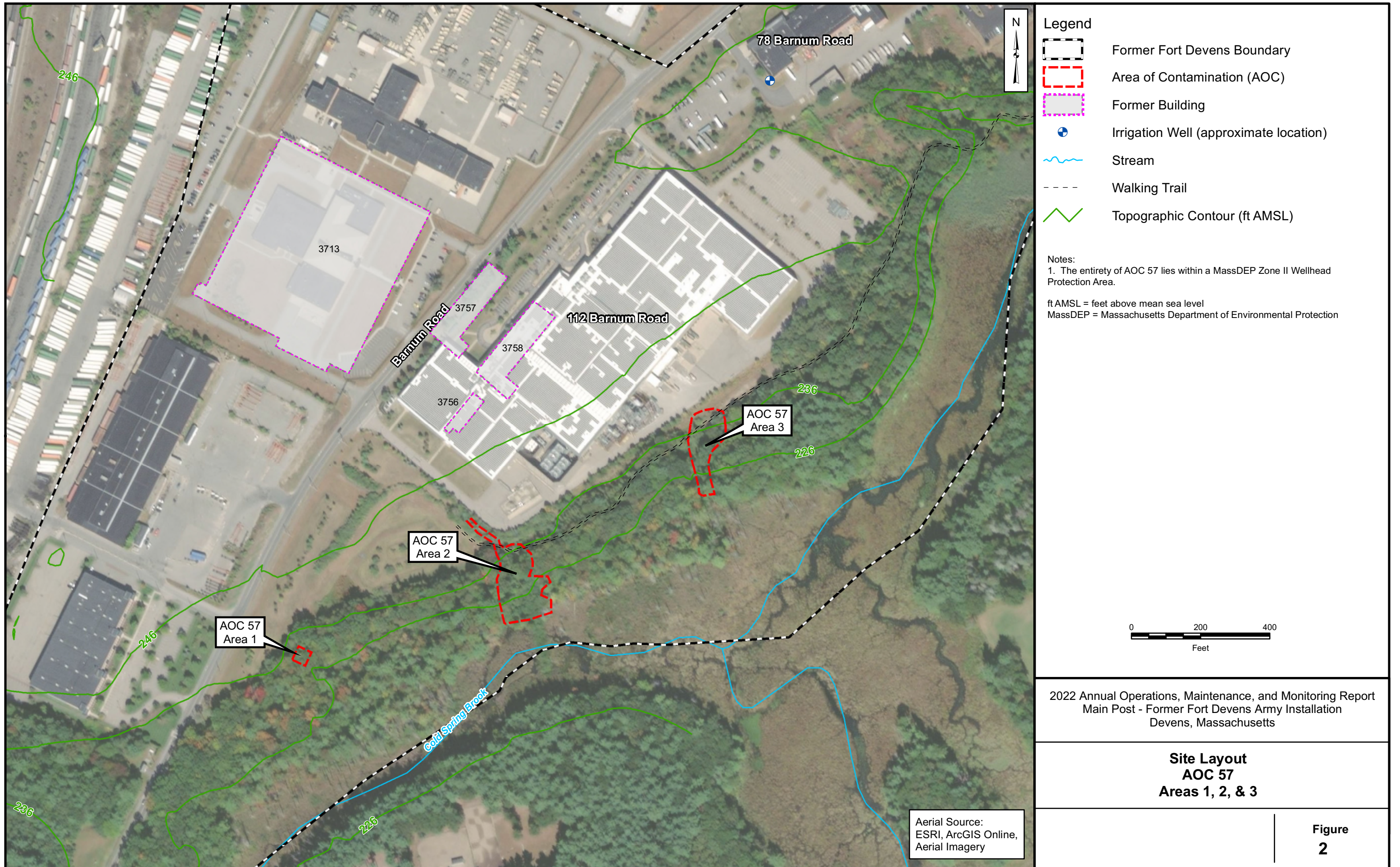
MassDEP = Massachusetts Department of Environmental Protection



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Devens, Massachusetts

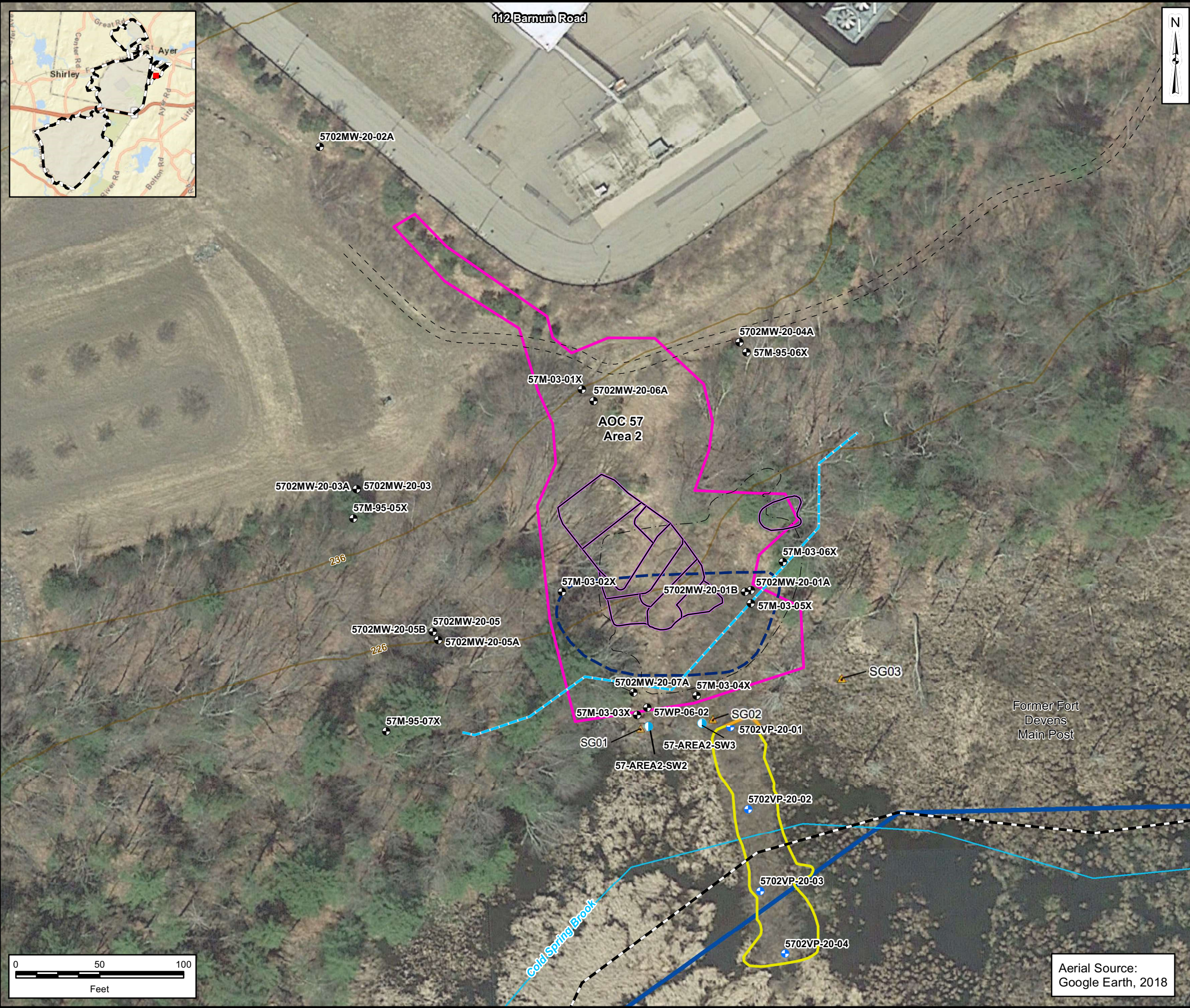
**Site Location
Former Fort Devens
Army Installation**

Aerial Source:
ESRI, ArcGIS Online,
Aerial Imagery



File: Figure 2 - AOC57 Site Layout.mxd

Document Path: T:\ENVD\Devens_RFTA\Seed_Task_Order\MXDs\AOC 57 Supplemental Remedial Investigation Work Plan\Figure 1-3-AOC57-2 Site Layout.mxd Date Saved: 12/3/2021 1:29:42 PM User Name: MSMiller



Legend

- Former Fort Devens Boundary
- Area of Contamination (AOC)
- Final Excavation Limit (2003)
- Conti Excavation Limit (2002)
- Flagged Wetland Limits
- Approximate Historical Extent of Groundwater Contamination in Exceedance of Cleanup Goals (based on fall 2003 to spring 2008 analytical data) (2008 Annual Report, HGL, 2009)
- Containment Dam
- Stream
- Walking Trail
- Topographic Contour (ft amsl)
- Monitoring Well
- Vertical Profile
- Surface Water Sample Location
- Staff Gauge

Notes and Abbreviations:
 1. ft AMSL = feet above mean sea level

2022 Annual Operations, Maintenance, and Monitoring Report
Main Post - Former Fort Devens Army Installation
Devens, Massachusetts

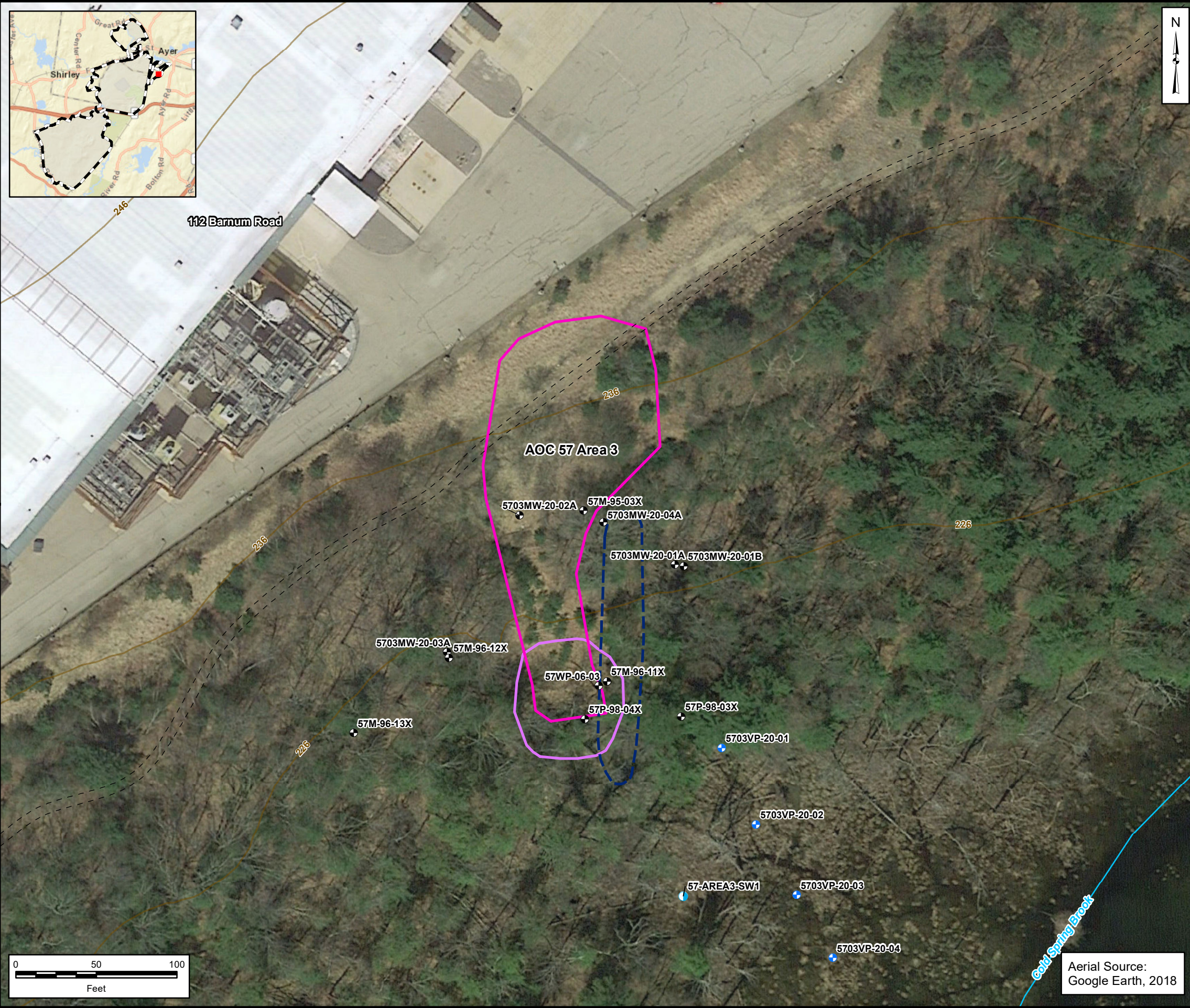
**Site Layout
AOC 57
Area 2**

**Figure
3**



Aerial Source:
Google Earth, 2018

Document Path: T:\ENVD\Devens_RFTA\Seed_Task_Order\MXDs\AOC 57 Supplemental Remedial Investigation Work Plan\Figure 1-4 - AOC57-3 Site Layout.mxd Date Saved: 12/8/2021 1:33:25 PM User Name: MSMiller



Legend

- Former Fort Devens Boundary
- Area of Contamination (AOC)
- Approximate Historical Extent of Groundwater Contamination in Exceedance of Cleanup Goals (based on Fall 2003 to Spring 2008 analytical data) (2008 Annual Report, HGL, 2009)
- Alternate III-2a Estimated Soil Excavation Area
- Stream
- Walking Trail
- Topographic Contour (ft AMSL)
- Monitoring Well
- Vertical Profile
- Surface Water Sample Location

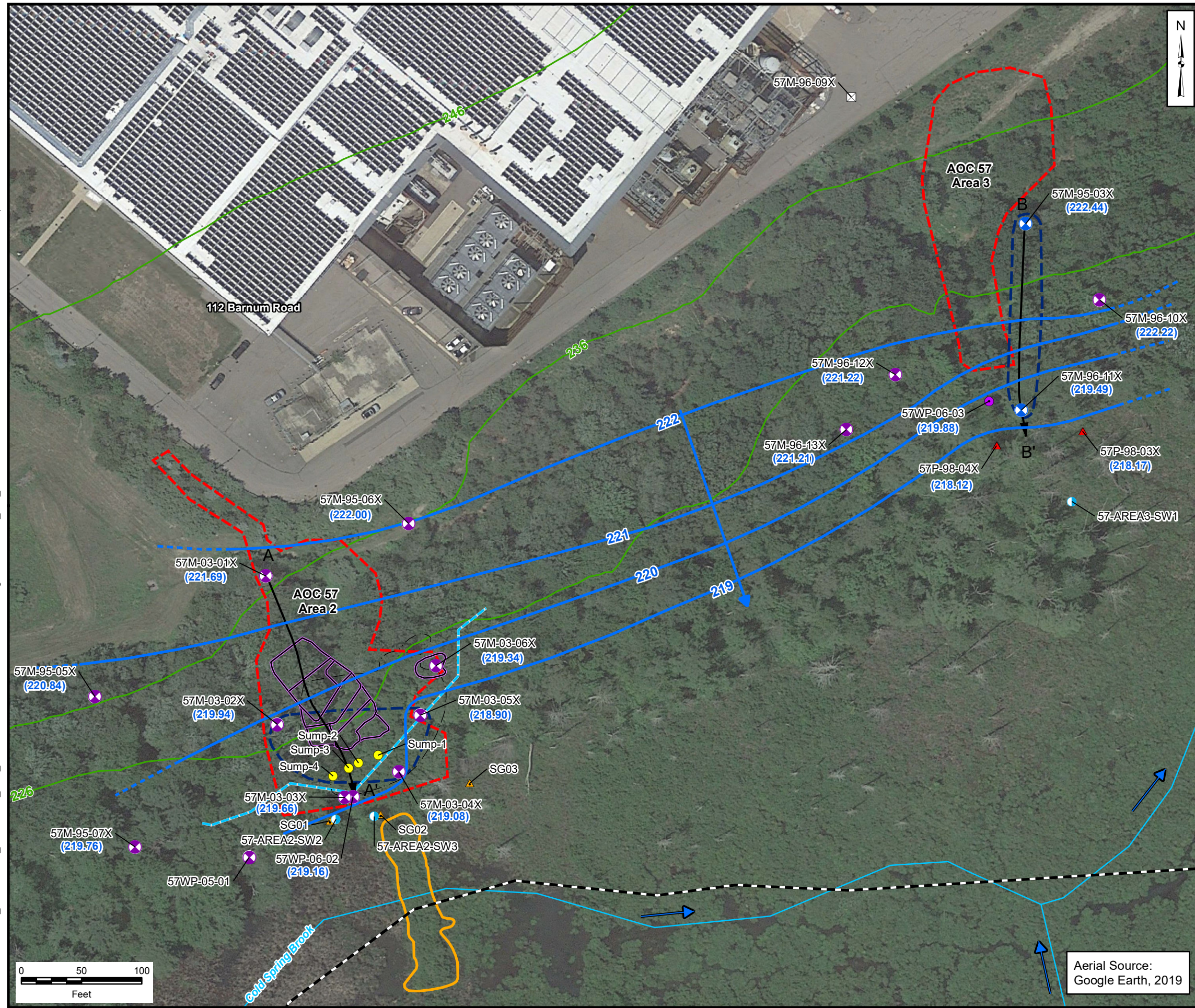
Notes and Abbreviations:
 1. ft AMSL = feet above mean sea level

2022 Annual Operations, Maintenance, and Monitoring Report
 Main Post - Former Fort Devens Army Installation
 Devens, Massachusetts

**Site Layout
 AOC 57
 Area 3**

File: Figure 1-4 - AOC57-3 Site Layout.mxd

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Legend

- Former Fort Devens Boundary
- Area of Contamination (AOC)
- LTM Well - Gauge Only
- Well Point - Gauge Only
- ▲ LTM Piezometer
- ▲ Staff Gauge
- Former Surface Water Sample Location
- Sump
- Monitoring Well - Destroyed
- LTM Sample Well
- ~ Groundwater Elevation Contour (ft NAVD88) (Contour Interval = 1 ft)
- ~ Groundwater Elevation Contour (ft NAVD88) (Contour Interval = 1 ft) (Inferred)
- A—A' Groundwater Gradient Calculation Location
- Final Excavation Limit (2003)
- Conti Excavation Limit (2002)
- Flagged Wetland Limits
- Approximate Historical Extent of Groundwater Contamination in Exceedance of Cleanup Goals (based on fall 2003 to spring 2008 analytical data) (2008 Annual Report, HGL, 2009)
- Containment Dam
- ~ Stream
- Groundwater Flow Direction
- Surface Water Flow Direction
- ~ Topographic Contour (ft AMSL)
- (218.17) Groundwater Elevation (ft NAVD88)

Notes:

1. The entirety of AOC 57 lies within a MassDEP Zone II Wellhead Protection Area.
2. Well 57WP-06-02 not used for contouring calculations.

ft AMSL = feet above mean sea level
 LTM = long-term monitoring
 MassDEP = Massachusetts Department of Environmental Protection
 NAVD88 = North American Vertical Datum of 1988

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 Main Post - Former Fort Devens Army Installation
 Devens, Massachusetts

Groundwater Elevation Contour Map
AOC 57 - Areas 2 & 3
Spring 2022

Aerial Source:
Google Earth, 2019

Figure
5

Notes:

Groundwater Cleanup Goals		Surface Water Benchmarks	
Metals	Result (µg/L)	Metals	Result (µg/L)
Arsenic (Total)	10	Arsenic (Dissolved)	150
Iron (Total)	NS	Iron (Dissolved)	1,000
Manganese (Total)	NS	Manganese (Dissolved)	NS

1. Bold concentrations indicate exceedances of Groundwater Cleanup Goal or Surface Water Benchmark.

ft AMSL = feet above mean sea level

J = estimated value

LTM = long-term monitoring

MassDEP = Massachusetts Department of Environmental Protection

NS = No Standard

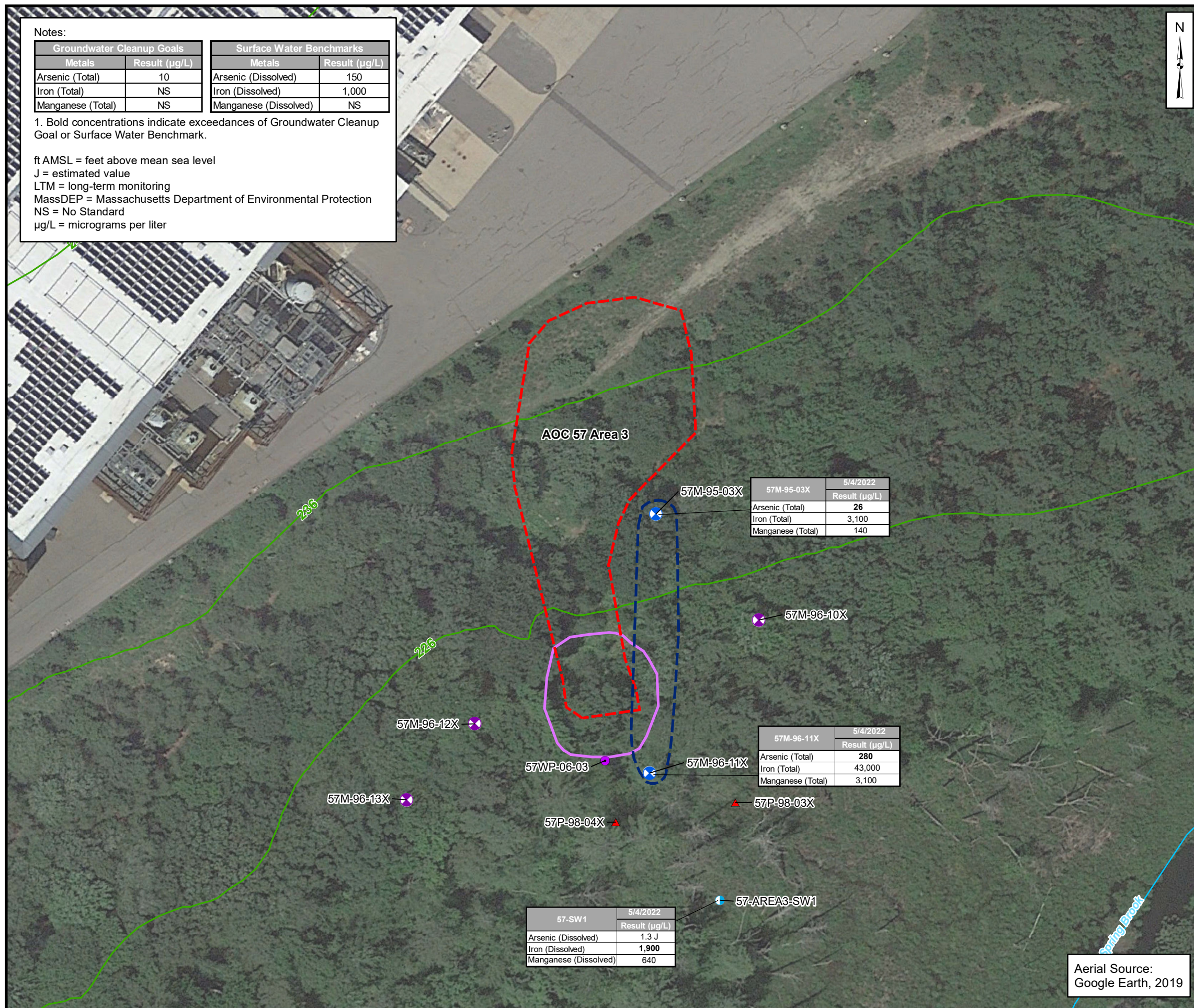
µg/L = micrograms per liter

Legend

- Area of Contamination (AOC)
- ⊗ LTM Sample Well
- ⊗ LTM Well - Gauge Only
- Well Point - Gauge Only
- ▲ LTM Piezometer
- Surface Water Sample Location
- Approximate Historical Extent of Groundwater Contamination in Exceedance of Cleanup Goals (based on Fall 2003 to Spring 2008 analytical data) (2008 Annual Report, HGL, 2009)
- Alternate III-2a Estimated Soil Excavation
- ~ Stream
- ∩ Topographic Contour (ft AMSL)

Note:

1. The entirety of AOC 57 lies within a MassDEP Zone II Wellhead Protection Area.

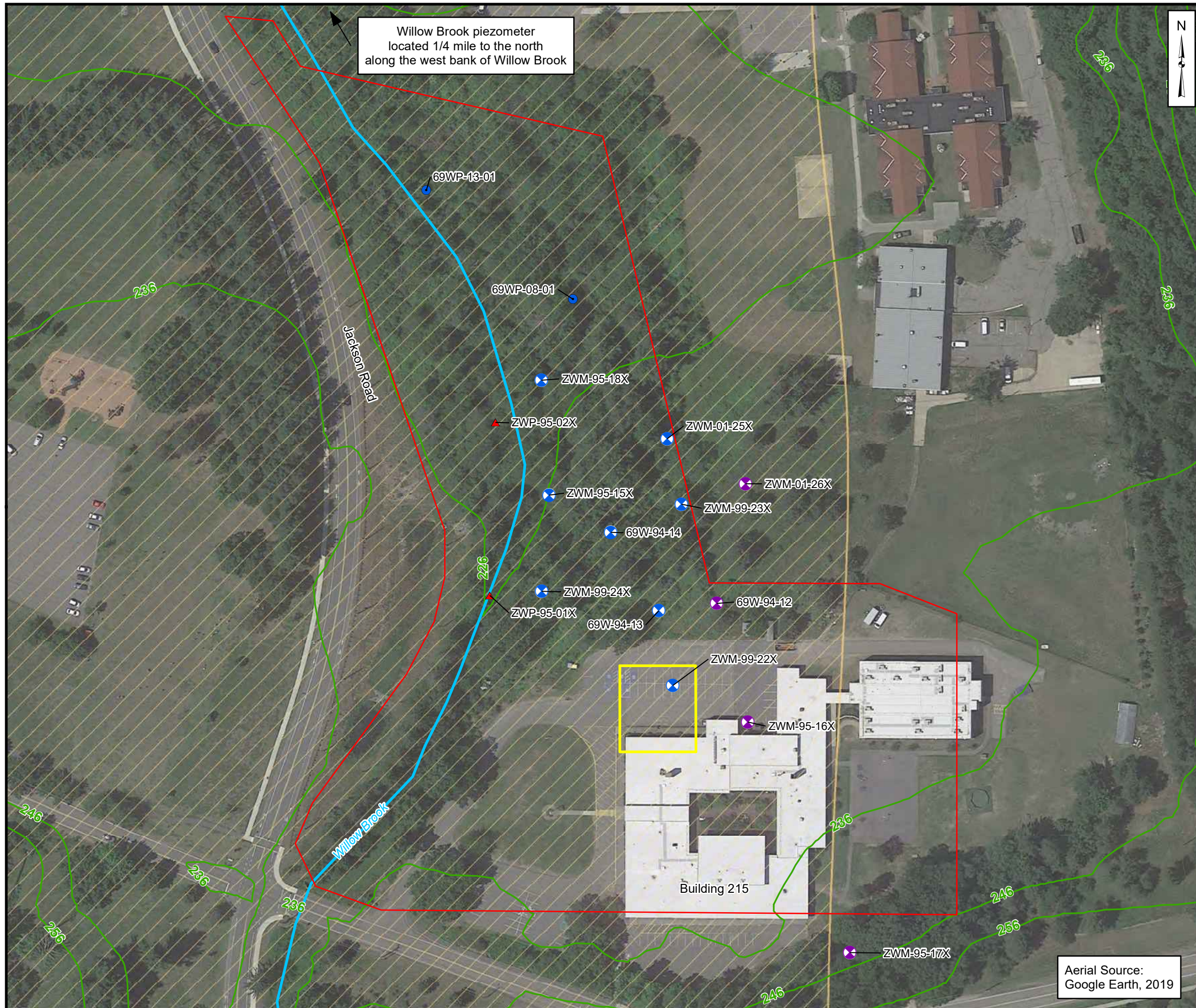


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Devens, Massachusetts

**Metals Concentrations in Groundwater and Surface Water
AOC 57 - Area 3
Spring 2022**

Aerial Source:
Google Earth, 2019

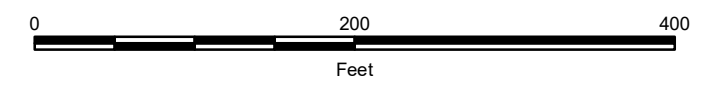
**Figure
6**



Legend

- Parcel Boundary
- ⊗ LTM Sample Well
- LTM Sample Well Point
- ⊗ LTM Well - Gauge Only
- ▲ LTM Piezometer
- Surface Water Course
- Excavated Soils Management Area
- Topographic Contour (Ft AMSL)
- MassDEP Zone II Wellhead Protection Area

ft AMSL = feet above mean sea level
 LTM = long-term monitoring
 MassDEP = Massachusetts Department of Environmental Protection

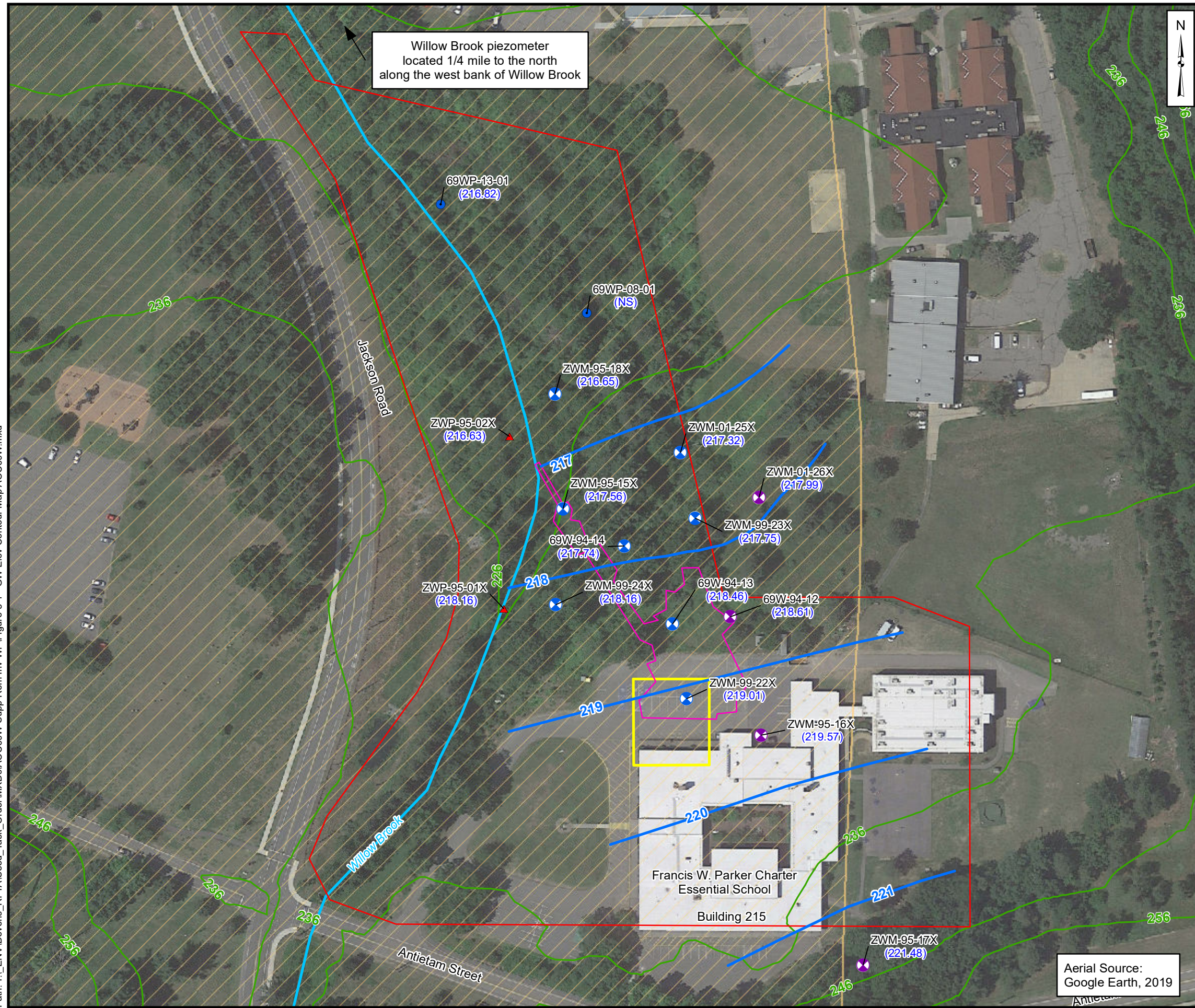


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 Main Post - Former Fort Devens Army Installation
 Devens, Massachusetts

**Site Layout
 AOC 69W**

Aerial Source:
 Google Earth, 2019

Path: T:_ENV\Devens_RFTA\Seed_Task_Order\MXDs\AOC69W_Supp_Rem_Inv_WP\Figure 3-1 - GW Elev Contour Map AOC69W.mxd

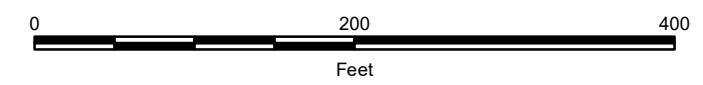


Legend

- Parcel Boundary (Parcel A15 Boundary)
- ⊗ LTM Sample Well
- LTM Sample Well Point
- ⊗ LTM Well - Gauge Only
- ▲ LTM Piezometer
- Surface Water Course
- Groundwater Elevation Contour (ft. NAVD88) (Contour Interval 1 ft.)
- Excavated Soils Management Area (ESMA)
- Soil Excavation Limits (1997-1998)
- Topographic Contour (ft AMSL)
- MassDEP Zone II Wellhead Protection Area
- (221.48) Groundwater Elevation (ft. NAVD88)

Note:
 Boundaries and site features shown on the figure are approximate.
 Historical site features digitized from historical site plan "Figure ES-1, RI Sampling Locations, AOC 69W" (Harding Lawson Associates, Inc. 1998)

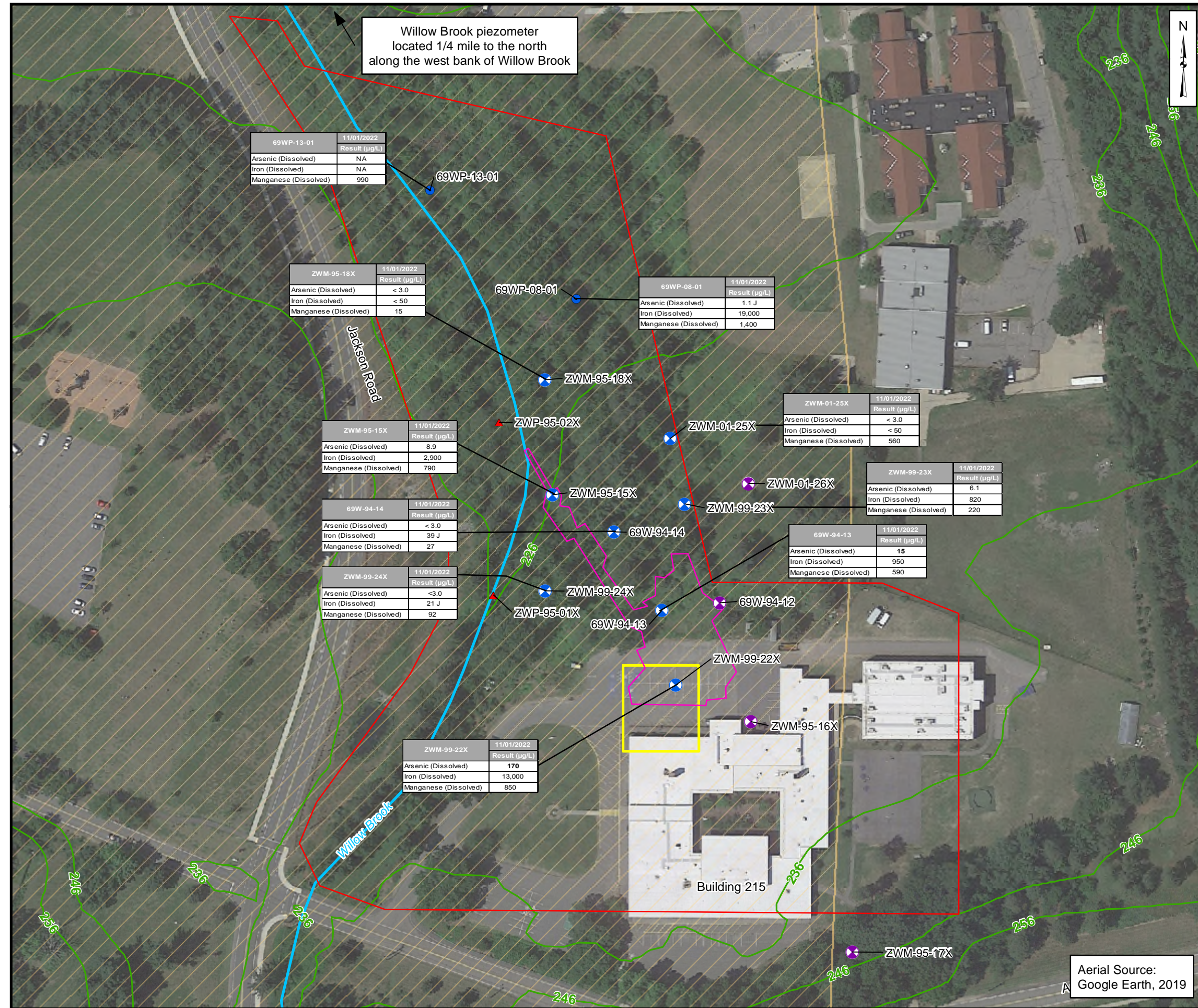
AOC = area of contamination
 ft AMSL = feet above mean sea level
 LTM = long-term monitoring
 MassDEP = Massachusetts Department of Environmental Protection
 UST = underground storage tank
 NS = not surveyed



2022 Annual Operations, Maintenance, and Monitoring Report
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**Groundwater Elevation Contour Map
 AOC69W
 Fall 2022**

Aerial Source:
 Google Earth, 2019



Willow Brook piezometer located 1/4 mile to the north along the west bank of Willow Brook



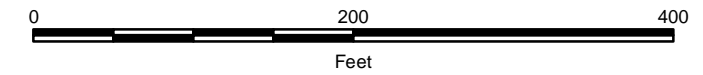
- Legend**
- ⊗ LTM Sample Well
 - LTM Sample Well Point
 - ⊗ LTM Well - Gauge Only
 - ▲ LTM Piezometer
 - Parcel Boundary
 - Surface Water Course
 - Excavated Soils Management Area
 - Soil Excavation Limits (1997-1998)
 - ~ Topographic Contour (ft AMSL)
 - MassDEP Zone II Wellhead Protection Area

Notes:

Cleanup Goals (µg/L)	
Arsenic (Dissolved)	10
Monitoring Criteria (µg/L)	
Iron (Dissolved)	9,100
Manganese (Dissolved)	375

1. Bold concentrations indicate exceedances of Groundwater Cleanup Goal.
2. AOC 69W lies within the MassDEP Zone II Wellhead Protection Area for the MacPherson well.

ft AMSL = feet above mean sea level
 J = estimated value
 LTM = long-term monitoring
 MassDEP = Massachusetts Department of Environmental Protection
 NA = not analyzed
 U = not detected
 µg/L = micrograms per liter



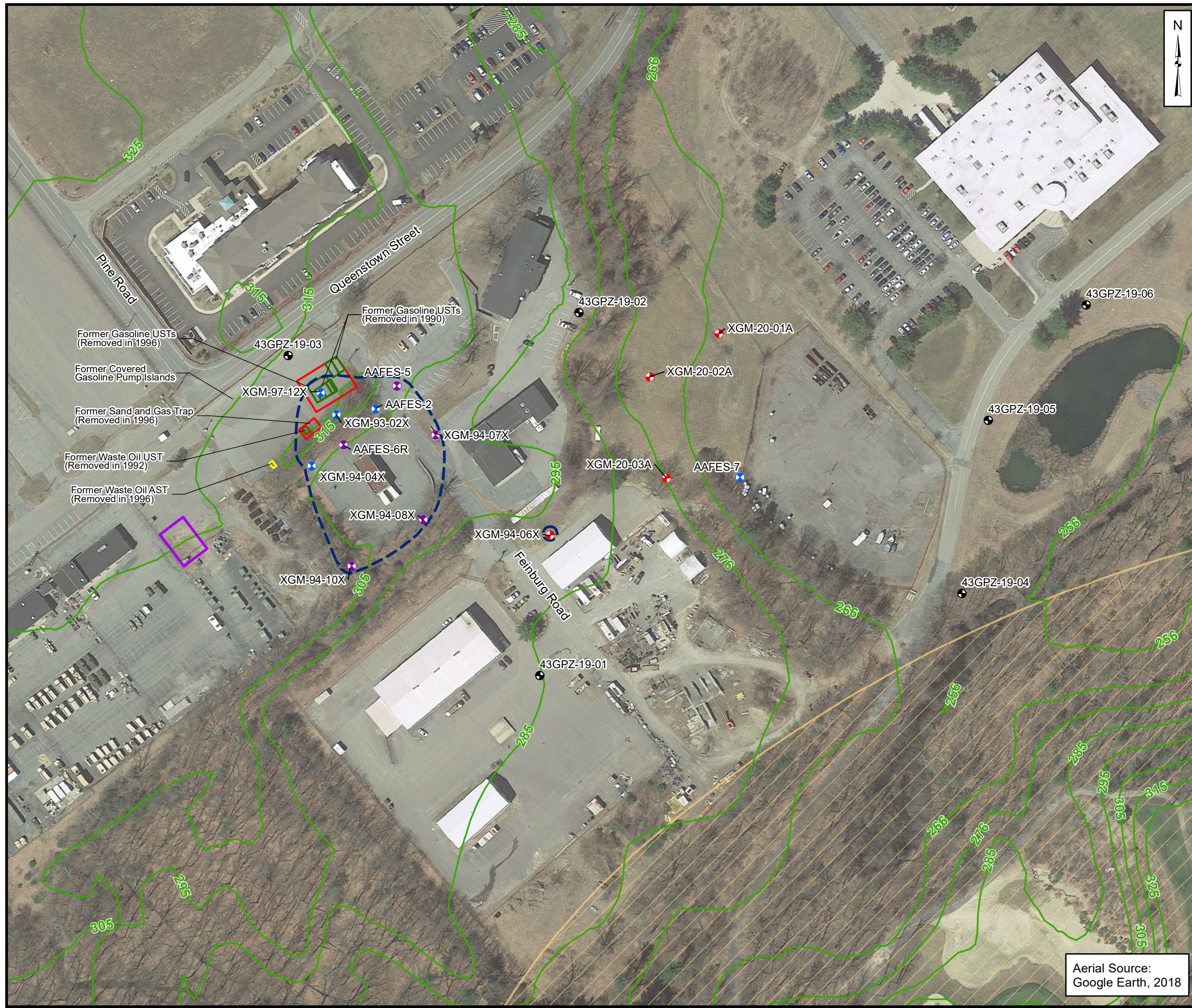
2022 Annual Operations, Maintenance, and Monitoring Report
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 Devens, Massachusetts

**Metals Concentrations in Groundwater
 AOC 69W
 Fall 2022**













Aerial Source:
 Google Earth, 2019

**Figure
 9**

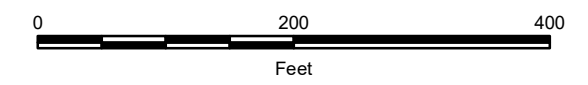
T:\ENV\Devens_RFTA\Seed_Task_Order\WXDs\Area 1 Phase 2 Work Plan\012052022\Figure 1-2 - AOC43G Site Layout V2.mxd 1/5/2022 1:53:38 PM User Name: MSMiller



Legend

-  LTM Sample Well
-  LTM Well - Gauge Only
-  Monitoring Well
-  Piezometer
-  Approximate Historical Extent of Groundwater Contamination in Exceedance of Cleanup Goals (based on 1999 to 2008 analytical data) (2008 Annual Report, HGL, 2009)
-  Area 1
-  Former Gasoline UST(s)
-  Former Waste Oil UST
-  Former Waste Oil
-  Former UST Area
-  Topographic Contour (ft amsl)
-  MassDEP Zone II Wellhead Protection Area

AST = aboveground storage tank
 ft AMSL = feet above mean sea level
 LTM = long-term monitoring
 MassDEP = Massachusetts Department of Environmental Protection
 UST = underground storage tank

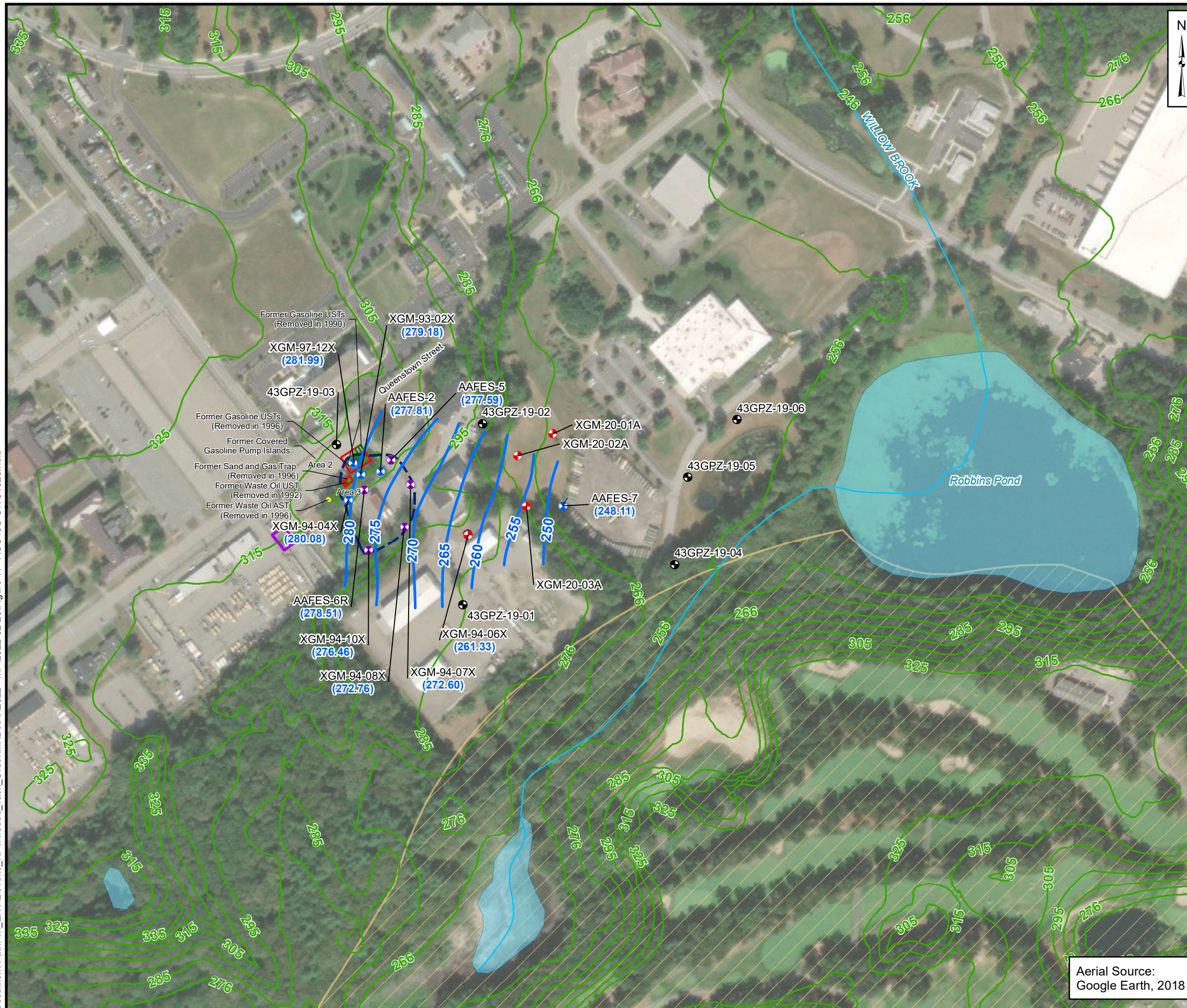


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 Main Post - Former Fort Devens Army Installation
 Devens, Massachusetts

**Site Layout
 AOC 43G**

Aerial Source:
 Google Earth, 2018

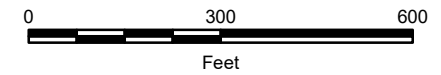
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Legend

- LTM Sample Well
- LTM Well - Gauge Only
- Monitoring Well
- Piezometer
- ~ Groundwater Elevation Contour (ft NAVD88)
(Contour Interval = 5 ft)
- Approximate Historical Extent of Groundwater Contamination in Exceedance of Cleanup Goals (based on 1999 to 2008 analytical data) (2008 Annual Report, HGL, 2009)
- Area 1
- Former Gasoline UST(s)
- Former Waste Oil UST
- Former Waste Oil AST
- Former UST Area
- ~ Stream
- ~ Waterbody
- ~ Topographic Contour (ft AMSL)
- MassDEP Zone II Wellhead Protection Area
- (261.33) Groundwater Elevation (ft NAVD88)

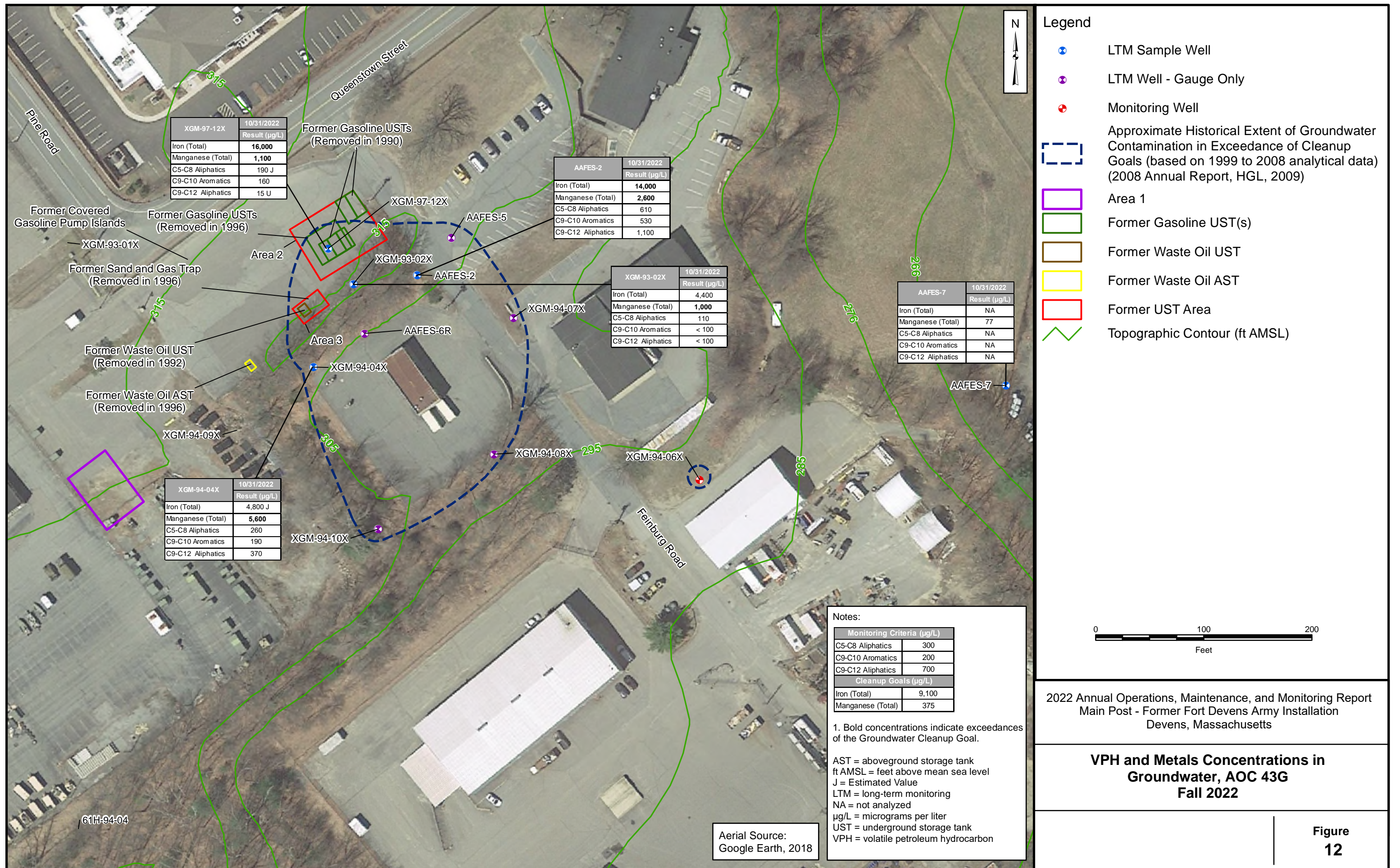
Notes:
 AST = aboveground storage tank
 ft AMSL = feet above mean sea level
 LTM = long-term monitoring
 MassDEP = Massachusetts Department of Environmental Protection
 NAVD88 = North American Vertical Datum of 1988
 UST = underground storage tank



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 Devens, Massachusetts









**Groundwater Elevation Contour Map
 AOC 43G
 Fall 2022**

Aerial Source:
 Google Earth, 2018

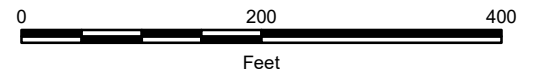




Legend

-  LTM Sample Well
-  LTM Well - Periodic Gauge Only
-  MassDEP Zone II Wellhead Protection Area
-  Former Storage Tank(s)
-  Former Building
-  Approximate Historical Extent of Groundwater Contamination in Exceedance of Cleanup Goals (based on April 2002 to October 2008 analytical data) (2008 Annual Report, HGL, 2009)
-  Remaining Bedrock Outcrop
-  Topographic Contour (ft AMSL)

AST = aboveground storage tank
 DRMO = Defense Reutilization and Marketing Office
 ft AMSL = feet above mean sea level
 LTM = long-term monitoring
 MassDEP = Massachusetts Department of Environmental Protection
 UST = underground storage tank

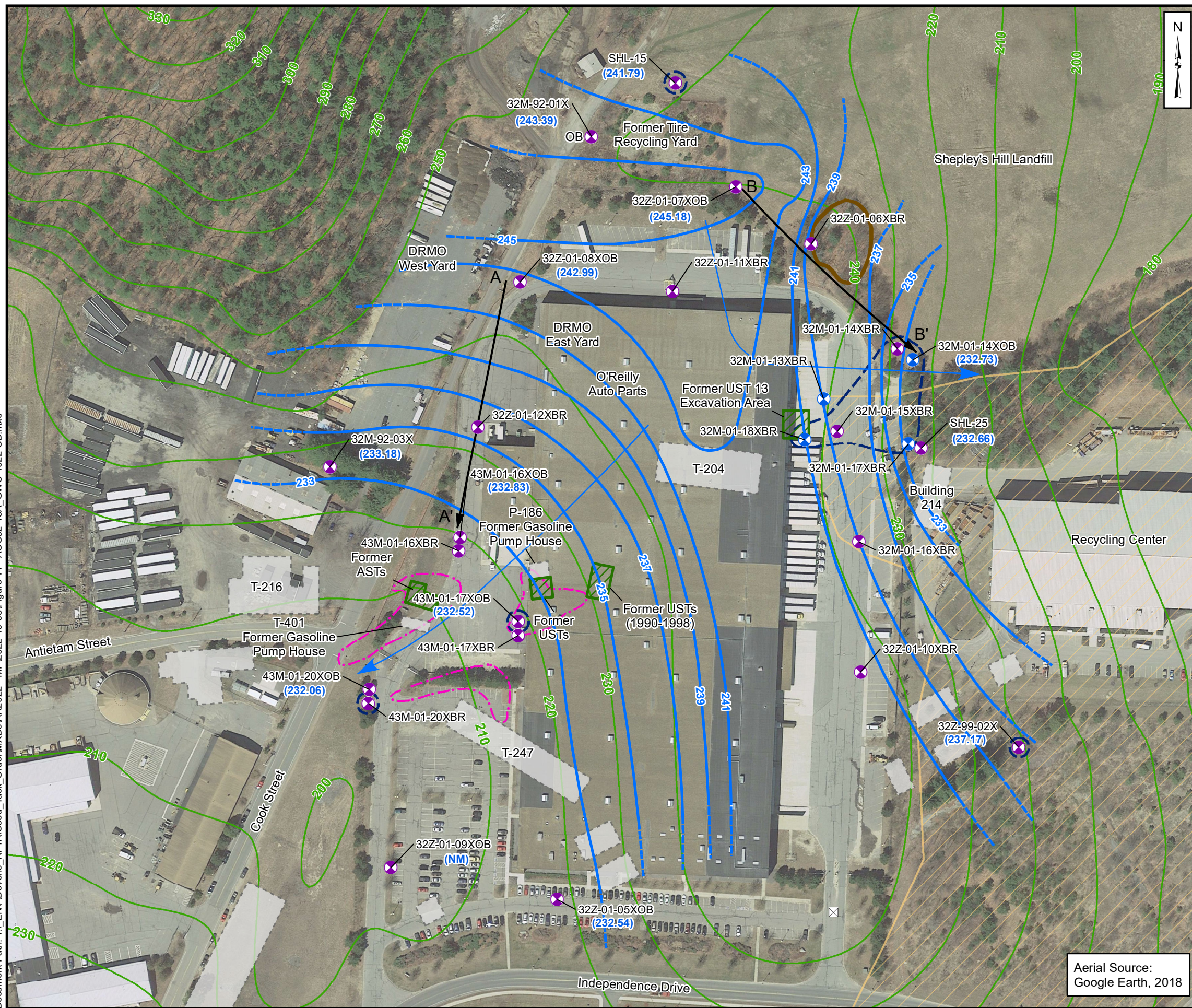


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**Site Layout
 AOC 32/43A**

Aerial Source:
 Google Earth, 2018

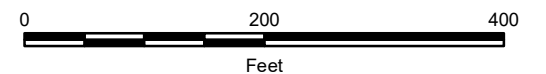
Document Path: T:_ENV\Devens_RFTA\Seed_Task_Order\MXD\AR2022 - MP\2022-10-03\Figure 14 - AOC32-43A_GWC-1022 OB.mxd



Legend

- LTM Sample Well
- LTM Well - Periodic Gauge Only
- Monitoring Well - Paved Over
- Groundwater Contour (ft NAVD88) (Interval = 2 ft)
- Groundwater Contour (ft NAVD88) (Interval = 2 ft) (Inferred)
- Groundwater Flow Direction
- Groundwater Gradient Calculation Location
- MassDEP Zone II Wellhead Protection Area
- Former Storage Tank(s)
- Former Building
- Approximate Historical Extent of Groundwater Contamination in Exceedance of Cleanup Goals (based on April 2002 to October 2008 analytical data) (2008 Annual Report, HGL, 2009)
- TPH Soil Contamination
- Remaining Bedrock Outcrop
- Bedrock Surface Contour
- Groundwater Elevation (ft NAVD88)

AST = aboveground storage tank
 DRMO = Defense Reutilization and Marketing Office
 ft AMSL = feet above mean sea level
 LTM = long-term monitoring
 MassDEP = Massachusetts Department of Environmental Protection
 NAVD88 = North American Vertical Datum of 1988
 TPH = total petroleum hydrocarbons
 UST = underground storage tank
 NM = not measured

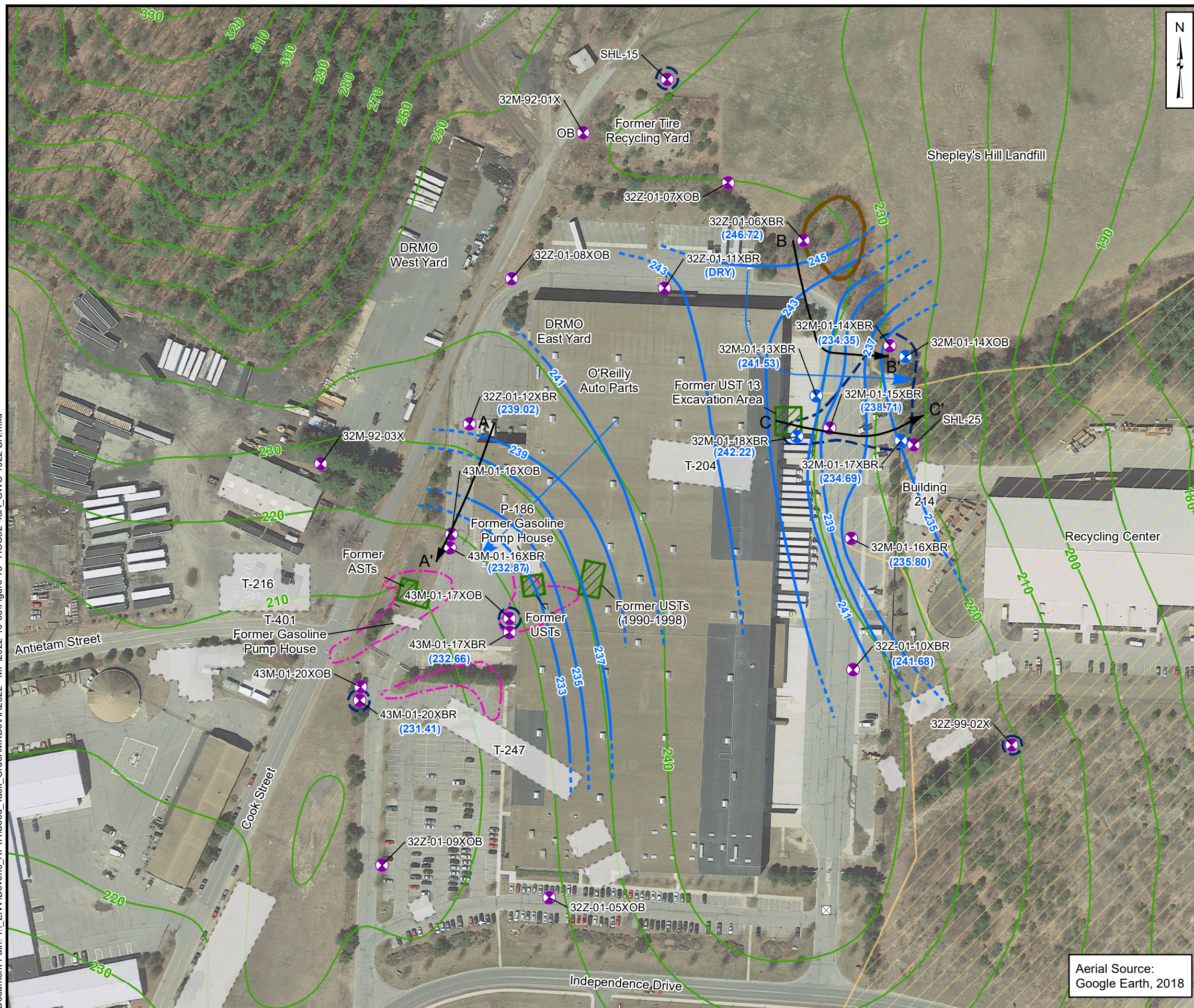


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**Groundwater Elevation Contour Map
 Overburden Wells, AOC 32/43A
 Spring 2022**

Aerial Source:
 Google Earth, 2018

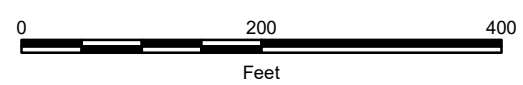
Document Path: T:\ENVIDevens_RFTA\Seed_Task_Order\MXDs\AR2022 - MP\2022-10-03\Figure 15 - AOC32-43A_GWC-1022 BR.mxd



Legend

- LTM Sample Well
- LTM Well - Periodic Gauge Only
- Monitoring Well - Paved Over
- Groundwater Contour (ft NAVD88) (Interval = 2 ft)
- Groundwater Contour (ft NAVD88) (Interval = 2 ft) (Inferred)
- Groundwater Flow Direction
- Groundwater Gradient Calculation Location
- MassDEP Zone II Wellhead Protection Area
- Former Storage Tank(s)
- Former Building
- Approximate Historical Extent of Groundwater Contamination in Exceedance of Cleanup Goals (based on April 2002 to October 2008 analytical data) (2008 Annual Report, HGL, 2009)
- TPH Soil Contamination
- Remaining Bedrock Outcrop
- Bedrock Surface Contour
- Groundwater Elevation (ft NAVD88)

ft AMSL = feet above mean sea level
 AST = aboveground storage tank
 DRMO = Defense Reutilization and Marketing Office
 LTM = long-term monitoring
 MassDEP = Massachusetts Department of Environmental Protection
 NAVD88 = North American Vertical Datum of 1988
 TPH = total petroleum hydrocarbons
 UST = underground storage tank



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**Groundwater Elevation Contour Map
 Bedrock Wells, AOC 32/43A
 Spring 2022**

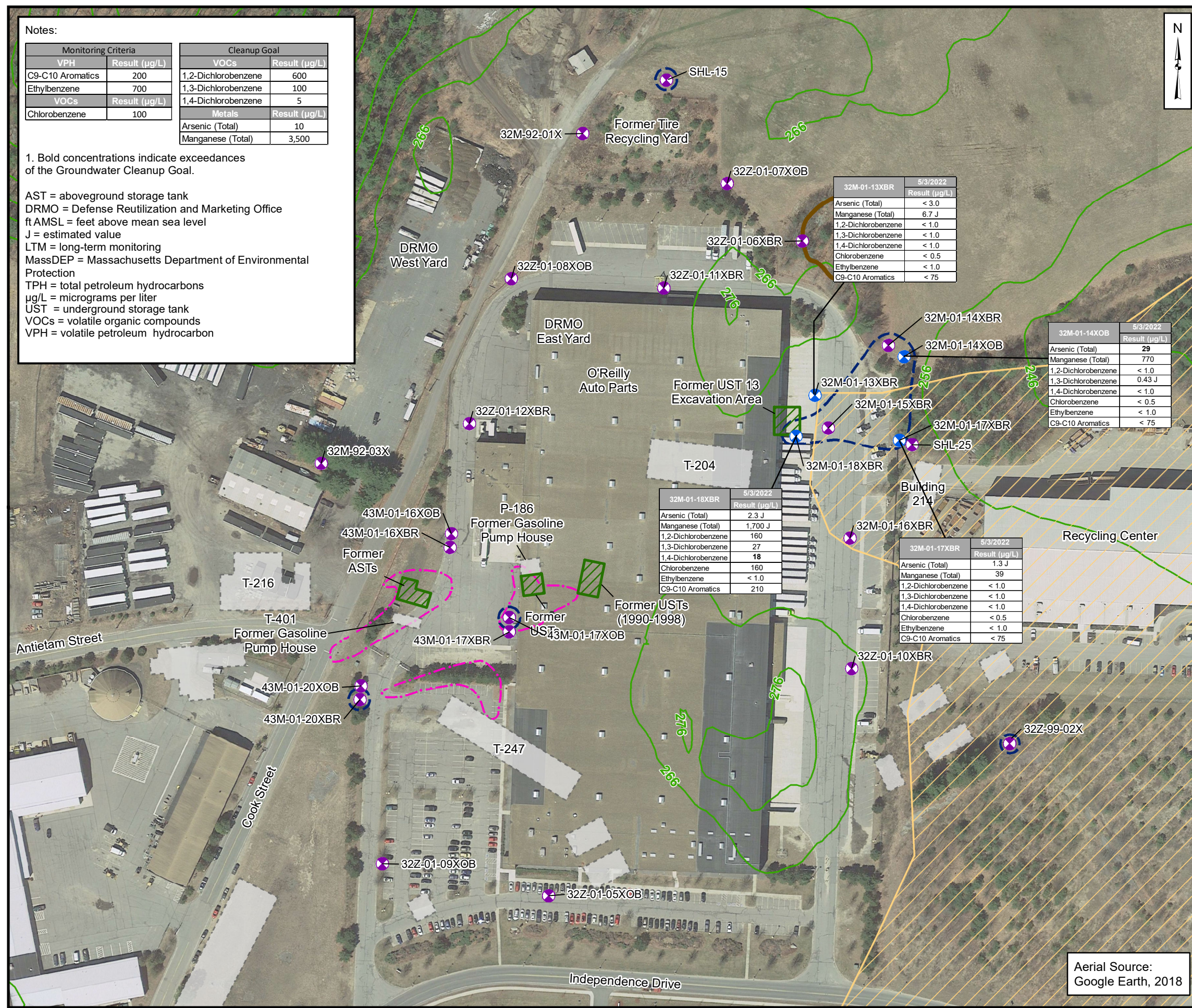
Aerial Source:
 Google Earth, 2018

Notes:

Monitoring Criteria		Cleanup Goal	
VPH	Result (µg/L)	VOCs	Result (µg/L)
C9-C10 Aromatics	200	1,2-Dichlorobenzene	600
Ethylbenzene	700	1,3-Dichlorobenzene	100
VOCs	Result (µg/L)	1,4-Dichlorobenzene	5
Chlorobenzene	100	Metals	Result (µg/L)
		Arsenic (Total)	10
		Manganese (Total)	3,500

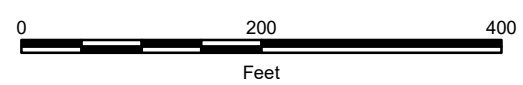
1. Bold concentrations indicate exceedances of the Groundwater Cleanup Goal.

AST = aboveground storage tank
 DRMO = Defense Reutilization and Marketing Office
 ft AMSL = feet above mean sea level
 J = estimated value
 LTM = long-term monitoring
 MassDEP = Massachusetts Department of Environmental Protection
 TPH = total petroleum hydrocarbons
 µg/L = micrograms per liter
 UST = underground storage tank
 VOCs = volatile organic compounds
 VPH = volatile petroleum hydrocarbon



Legend

- LTM Sample Well
- LTM Well - Periodic Gauge Only
- MassDEP Zone II Wellhead Protection Area
- Former Storage Tank(s)
- Former Building
- Approximate Historical Extent of Groundwater Contamination in Exceedance of Cleanup Goals (based on April 2002 to October 2008 analytical data) (2008 Annual Report, HGL, 2009)
- TPH Soil Contamination
- Remaining Bedrock Outcrop
- Topographic Contour (ft AMSL)



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**VOCs, VPH, and Metals Concentrations in
 Groundwater, AOC 32/43A
 Spring 2022**

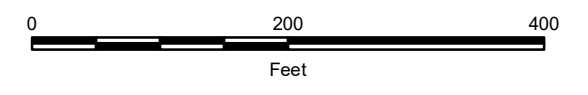
Aerial Source:
 Google Earth, 2018



Legend

- Gas Vent
- Monitoring Well - Destroyed
- LTM Sample Well
- LTM Well - Gauge Only
- Landfill Gas Monitoring Well
- Topographic Contour (ft AMSL)
- MassDEP Zone II Wellhead Protection Area

ft AMSL = feet above mean sea level
 LTM = long-term monitoring
 MassDEP = Massachusetts Department of Environmental Protection
 Note: Monitoring wells LFM-99-01B, LFM-99-02B, LFM-99-03B, and LFM-99-05B are screened in bedrock.



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**Site Layout
 Devens Consolidated Landfill**

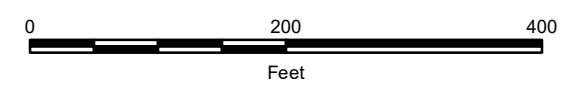
Aerial Source:
 Google Earth, 2018



- Legend**
- LTM Sample Well
 - LTM Well - Gauge Only
 - Gas Vent
 - Monitoring Well - Destroyed
 - Landfill Gas Monitoring Well
 - Groundwater Elevation Contour (ft NAVD88) (Contour Interval = 10 ft)
 - Groundwater Flow Direction
 - Groundwater Gradient Calculation Location
 - Topographic Contour (ft AMSL)
 - Leachate Building Location
 - MassDEP Zone II Wellhead Protection Area
 - (297.92) Groundwater Elevation (ft NAVD88)

ft AMSL = feet above mean sea level
 LTM = long-term monitoring
 NAVD88 = North American Vertical Datum of 1988

Note: Monitoring wells LFM-03-07, LFM-99-05A, and LFM-99-06ARP not used for contouring (wells screened in overburden)



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**Groundwater Elevation Contour Map - Bedrock Wells
 Devens Consolidated Landfill
 Spring 2022**















**Figure
 18**

Aerial Source:
 Google Earth, 2018

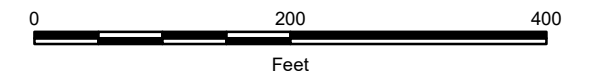


Legend

-  LTM Sample Well
-  LTM Well - Gauge Only
-  Gas Vent
-  Monitoring Well - Destroyed
-  Landfill Gas Monitoring Well
-  Groundwater Elevation Contour (ft NAVD88)
(Contour Interval = 10 ft)
-  Groundwater Flow Direction
-  A—A' Groundwater Gradient Calculation Location
-  Topographic Contour (ft AMSL)
-  MassDEP Zone II Wellhead Protection Area
-  (334.41) Groundwater Elevation (ft NAVD88)
-  Leachate Building Location

ft AMSL = feet above mean sea level
 LTM = long-term monitoring
 NAVD88 = North American Vertical Datum of 1988

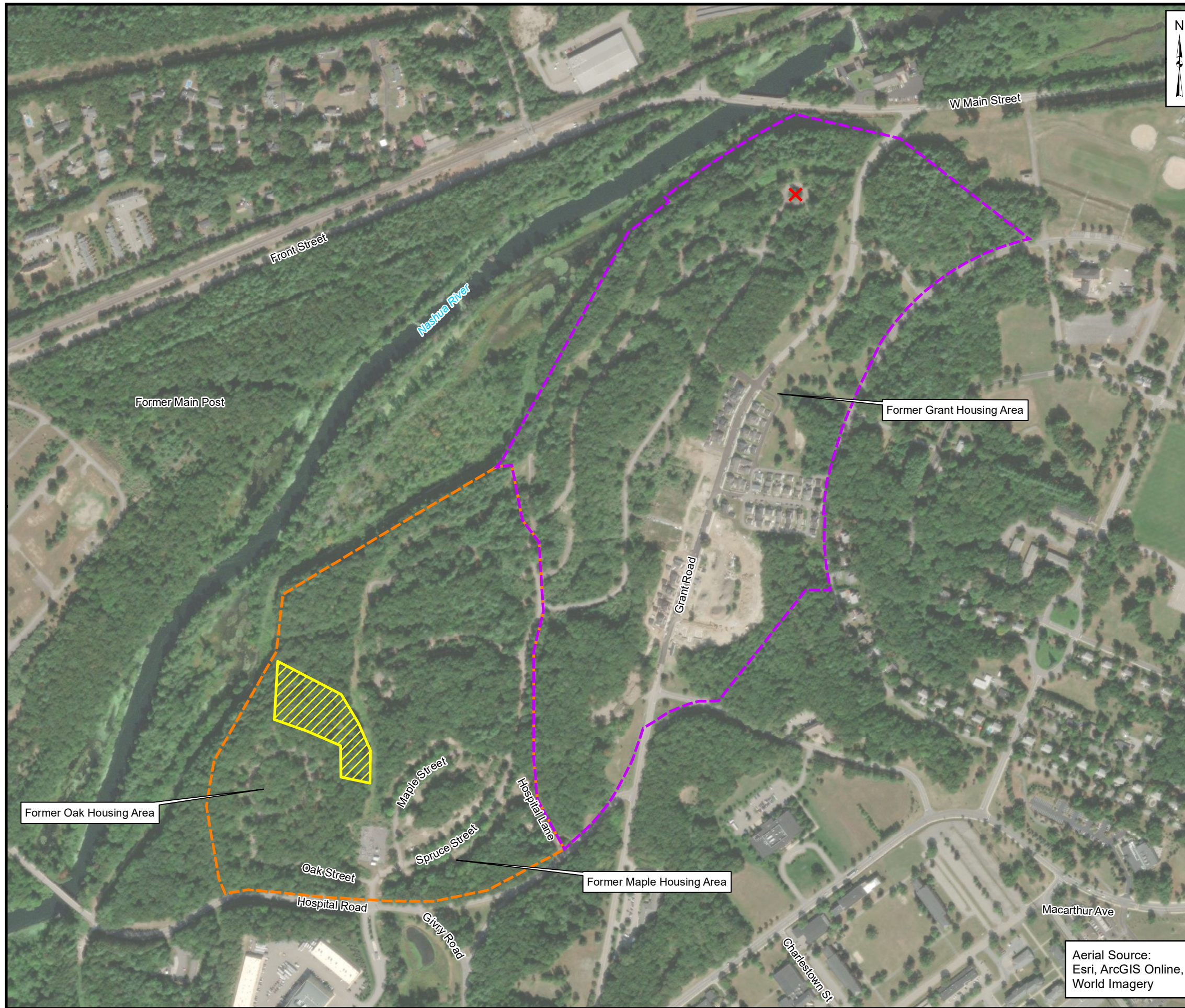
Note: Monitoring wells LFM-03-07, LFM-99-05A, and LFM-99-06ARP not used for contouring (wells screened in overburden)



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 Devens, Massachusetts

**Groundwater Elevation Contour Map - Bedrock Wells
 Devens Consolidated Landfill
 Fall 2022**

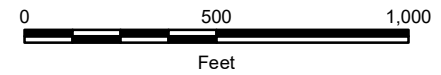
Aerial Source:
 Esri, ArcGIS Online,
 World Imagery



Legend

- Portion of Former Grant Housing Area (Subject to 2009 ROD/2011 LUCIP LUCs)
- Former Oak; Former Maple, and a portion of the Former Grant Housing Area (i.e. Restricted Area) (Subject to 2021 LUCIP Addendum/NAUL/SSSMP LUCs)
- 37-mm Impact Area
- Approximate Former Firing Location

LUC: Land Use Control
 LUCIP: Land Use Control Implementation Plan
 NAUL: Notice of Activity and Use Limitation
 ROD: Record of Decision
 SSSMP: Site-Specific Soils Management Plan



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Site Location
Grant Housing Area / Oak and Maple Housing Area / 37-mm Impact Area

Aerial Source:
 Esri, ArcGIS Online,
 World Imagery

Figure
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Appendix A

Groundwater Field Forms



Groundwater Gauging Log

Client:	USACE	Date(s):	04-27-2022 - 04-28-2022
Project Name:	Fort Devens	Event(s):	Spring 2022 LTM
Site Location:	Devens, MA	Site ID / Operational Area:	AOC 32/43A, DCL, AOC 57
Field Technician:	Diane Champagne, Grace Sheckler, Spencer Gust		Equipment: Solinst 101 water level meter

Well	Date	Time	Scope of Work Completed?	Static Water Level (ft bmp)	Total Depth (ft bmp)	Depth to Product (ft bmp)	Well Head PID Reading (ppmv)	Comments
AOC 32-43A								
32M-01-13XBR	04-27-2022	15:25	Yes	16.35	23.20	--	--	
32M-01-14XBR	04-27-2022	16:31	Yes	21.71	46.40	--	--	
32M-01-14XOB	04-27-2022	16:32	Yes	23.83	30.10	--	--	
32M-01-15XBR	04-27-2022	15:31	Yes	19.65	44.30	--	--	
32M-01-16XBR	04-27-2022	17:00	Yes	21.70	30.90	--	--	
32M-01-17XBR	04-27-2022	15:05	Yes	24.42	54.50	--	--	
32M-01-18XBR	04-29-2022	12:20	Yes	16.10	24.00	--	--	
32M-92-01X	04-27-2022	15:50	Yes	16.78	26.16	--	--	
32M-92-03X	04-27-2022	15:44	Yes	26.84	35.33	--	--	
32Z-01-05XOB	04-27-2022	15:27	Yes	28.86	35.00	--	--	
32Z-01-06XBR	04-27-2022	16:23	Yes	15.13	28.75	--	--	
32Z-01-07XOB	04-27-2022	16:36	Yes	14.30	23.88	--	--	
32Z-01-08XOB	04-27-2022	17:24	Yes	17.50	24.40	--	--	
32Z-01-09XOB	--	--	No	--	--	--	--	Bolts hit by plow - cannot open/gauge well.
32Z-01-10XBR	04-27-2022	17:13	Yes	15.73	34.43	--	--	
32Z-01-11XBR	04-27-2022	16:49	Yes	DRY	16.95	--	--	
32Z-01-12XBR	04-27-2022	17:12	Yes	18.83	37.60	--	--	
32Z-99-02X	04-27-2022	17:15	Yes	22.54	29.61	--	--	
43M-01-16XBR	04-27-2022	15:06	Yes	23.97	56.81	--	--	
43M-01-16XOB	04-27-2022	15:12	Yes	24.05	33.61	--	--	
43M-01-17XBR	04-27-2022	14:39	Yes	25.63	57.14	--	--	
43M-01-17XOB	04-27-2022	14:45	Yes	25.56	32.90	--	--	
43M-01-20XBR	04-27-2022	14:03	Yes	25.89	77.69	--	--	
43M-01-20XOB	04-27-2022	14:14	Yes	25.34	33.05	--	--	
SHL-15	04-27-2022	15:57	Yes	17.04	26.75	--	--	

ft-bmp = feet below measuring point
ppmV = parts per million by volume



Groundwater Gauging Log

Client:	USACE	Date(s):	04-27-2022 - 04-28-2022
Project Name:	Fort Devens	Event(s):	Spring 2022 LTM
Site Location:	Devens, MA	Site ID / Operational Area:	AOC 32/43A, DCL, AOC 57
Field Technician:	Diane Champagne, Grace Sheckler, Spencer Gust		Equipment: Solinst 101 water level meter

Well	Date	Time	Scope of Work Completed?	Static Water Level (ft bmp)	Total Depth (ft bmp)	Depth to Product (ft bmp)	Well Head PID Reading (ppmv)	Comments
SHL-25	04-27-2022	17:26	Yes	25.35	36.10	--	--	
DCL								
LFM 99-06ARP	04-28-2022	10:38	Yes	14.99	35.00	--	--	
LFM-03-07	04-28-2022	08:07	Yes	17.80	23.38	--	--	
LFM-99-01B	04-28-2022	09:20	Yes	24.78	34.60	--	--	
LFM-99-02B	04-28-2022	08:32	Yes	16.19	26.40	--	--	
LFM-99-03B	04-28-2022	09:51	Yes	39.50	51.00	--	--	
LFM-99-05A	04-28-2022	11:12	Yes	21.63	30.88	--	--	
LFM-99-05B	04-28-2022	11:14	Yes	18.66	58.61	--	--	
AOC 57								
57M-03-01X	04-28-2022	08:47	Yes	14.04	20.88	--	--	
57M-03-02X	04-28-2022	09:48	Yes	4.90	13.49	--	--	
57M-03-03X	04-28-2022	09:26	Yes	0.34	11.37	--	--	
57M-03-04X	04-28-2022	09:39	Yes	2.31	12.40	--	--	
57M-03-05X	04-28-2022	09:55	Yes	2.98	12.02	--	--	
57M-03-06X	04-28-2022	10:04	Yes	2.53	14.05	--	--	
57M-95-03X	04-28-2022	08:51	Yes	10.35	19.60	--	--	
57M-95-05X	04-28-2022	10:30	Yes	14.31	22.42	--	--	
57M-95-06X	04-28-2022	08:40	Yes	12.39	24.34	--	--	
57M-95-07X	04-28-2022	09:08	Yes	2.60	14.15	--	--	
57M-96-10X	04-28-2022	09:02	Yes	6.53	7.68	--	--	
57M-96-11X	04-28-2022	09:10	Yes	2.71	14.69	--	--	
57M-96-12X	04-28-2022	09:41	Yes	4.58	15.14	--	--	
57M-96-13X	04-28-2022	09:45	Yes	4.37	15.00	--	--	
57P-98-03X	04-28-2022	09:36	Yes	2.22	7.00	--	--	
57P-98-04X	04-28-2022	09:30	Yes	3.63	6.95	--	--	

ft-bmp = feet below measuring point
ppmV = parts per million by volume



Groundwater Gauging Log

Client:	USACE	Date(s):	04-27-2022 - 04-28-2022
Project Name:	Fort Devens	Event(s):	Spring 2022 LTM
Site Location:	Devens, MA	Site ID / Operational Area:	AOC 32/43A, DCL, AOC 57
Field Technician:	Diane Champagne, Grace Sheckler, Spencer Gust		Equipment: Solinst 101 water level meter

Well	Date	Time	Scope of Work Completed?	Static Water Level (ft bmp)	Total Depth (ft bmp)	Depth to Product (ft bmp)	Well Head PID Reading (ppmv)	Comments
57WP-05-01	04-28-2022	09:17	Yes	1.90	2.02	--	--	
57WP-06-02	04-28-2022	09:30	Yes	1.13	24.05	--	--	
57WP-06-03	04-28-2022	09:21	Yes	0.63	19.18	--	--	

ft-bmp = feet below measuring point
 ppmV = parts per million by volume



Groundwater Gauging Log



Client:	USACE	Date(s):	10/27/2022 - 11/01/2022
Project Name:	Fort Devens	Event(s):	Fall 2022 LTM
Site Location:	Devens, MA	Site ID / Operational Area:	Main Post
Field Technician:	Spencer Gust, Diane Champagne, Grace Sheckler		Equipment: Solinst 101 water level probe

Well	Date	Time	Scope of Work Completed?	Static Water Level (ft bmp)	Total Depth (ft bmp)	Depth to Product (ft bmp)	Well Head PID Reading (ppmv)	Comments
AOC 43G								
AAFES-2	10-31-2022	09:12	Yes	23.91	33.40	--	--	
AAFES-5	10-31-2022	13:51	Yes	22.21	29.90	--	--	
AAFES-6R	10-31-2022	09:29	Yes	20.23	27.32	--	--	
AAFES-7	10-31-2022	09:56	Yes	10.69	17.19	--	--	
XGM-93-02X	10-31-2022	09:22	Yes	29.83	37.50	--	--	
XGM-94-04X	10-31-2022	09:23	Yes	20.61	31.10	--	--	
XGM-94-06X	10-31-2022	09:23	Yes	22.74	30.12	--	--	
XGM-94-07X	10-31-2022	09:08	Yes	22.22	31.60	--	--	
XGM-94-08X	10-31-2022	09:31	Yes	26.22	36.00	--	--	
XGM-94-10X	10-31-2022	09:42	Yes	25.50	34.83	--	--	
XGM-97-12X	10-31-2022	09:15	Yes	26.71	34.00	--	--	
AOC 69W								
69W-94-12	11-01-2022	09:30	Yes	9.53	16.00	--	--	
69W-94-13	11-01-2022	09:35	Yes	8.53	16.20	--	--	
69W-94-14	11-01-2022	10:14	Yes	9.48	15.25	--	--	
69WP-08-01	11-01-2022	09:31	Yes	4.49	12.49	--	--	
69WP-13-01	11-01-2022	10:45	Yes	3.88	12.42	--	--	
Willow Brook PZ	11-01-2022	10:32	Yes	2.45	3.70	--	--	
ZWM-01-25X	11-01-2022	09:51	Yes	7.39	16.09	--	--	

ft-bmp = feet below measuring point
ppmV = parts per million by volume



Groundwater Gauging Log



Client:	USACE	Date(s):	10/27/2022 - 11/01/2022
Project Name:	Fort Devens	Event(s):	Fall 2022 LTM
Site Location:	Devens, MA	Site ID / Operational Area:	Main Post
Field Technician:	Spencer Gust, Diane Champagne, Grace Sheckler		Equipment: Solinst 101 water level probe

Well	Date	Time	Scope of Work Completed?	Static Water Level (ft bmp)	Total Depth (ft bmp)	Depth to Product (ft bmp)	Well Head PID Reading (ppmv)	Comments
ZWM-01-26X	11-01-2022	08:55	Yes	8.82	16.17	--	--	
ZWM-95-15X	11-01-2022	08:40	Yes	7.45	14.74	--	--	
ZWM-95-16X	11-01-2022	14:36	Yes	8.01	16.81	--	--	
ZWM-95-17X	11-01-2022	09:20	Yes	16.35	16.38	--	--	
ZWM-95-18X	11-01-2022	09:23	Yes	5.50	15.27	--	--	
ZWM-99-22X	11-01-2022	08:02	Yes	7.71	14.11	--	--	
ZWM-99-23X	11-01-2022	08:48	Yes	7.33	15.21	--	--	
ZWM-99-24X	11-01-2022	10:13	Yes	7.69	15.90	--	--	
ZWP-95-01X	11-01-2022	09:05	Yes	7.88	14.35	--	--	
ZWP-95-02X	11-01-2022	09:17	Yes	6.20	14.44	--	--	
DCL								
LFM-03-07	10-27-2022	08:12	Yes	23.34	23.35	--	--	
LFM-99-01B	10-27-2022	09:04	Yes	27.52	34.60	--	--	
LFM-99-02B	10-27-2022	07:50	Yes	19.42	26.30	--	--	
LFM-99-03B	10-27-2022	09:17	Yes	43.57	50.65	--	--	
LFM-99-05A	10-27-2022	09:45	Yes	25.61	30.76	--	--	
LFM-99-05B	10-27-2022	09:46	Yes	22.31	58.53	--	--	
LFM 99-06ARP	10-27-2022	08:00	Yes	17.31	34.91	--	--	

ft-bmp = feet below measuring point
ppmV = parts per million by volume

Groundwater Sampling Form



Well ID	57M-95-03X	Date	2022-05-04	Event	Spring 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	AOC 57 / Site Wide		
Weather(°F)	48 deg, showers		Field Technician		Spencer Gust		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	7.0-17.0	Casing Diameter (in)	4.0	Well Casing Material	NA
Static Water Level (ft-bmp)	10.54	Total Depth (ft-bmp)		Water Column(ft)	9.25	Gallons in Well	1.01
Depth to Product (ft-bmp)		Pump Intake Depth(ft-bmp)	13.8	Purge Method	Low-Flow	Purging Equipment	Peristaltic Pump
Purge Start Time	11:30	Total Volume Purged (ml)	2250	Sample ID	57M-95-03X	Sample Time	12:01
Purge End Time	12:01	Well Volumes Purged (total)	0.58	Replicate / Code No.	MS/MSD /	Water Quality Meter/ ID	YSI Pro DSS / 17E101955

Scope of work completed? Yes

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
11:35	0	100	10.54	375	6.28	0.031	2.3	1.61	9.1	-34.2	Clear	Strong
11:40	5	100	10.54	750	6.25	0.029	1.9	0.89	9.1	-43.1	Clear	Strong
11:45	10	100	10.54	1125	6.23	0.029	2.3	0.7	9	-49.8	Clear	Strong
11:50	15	100	10.54	1500	6.23	0.029	3.3	0.63	9	-55.3	Clear	Strong
11:55	20	100	10.54	1875	6.22	0.029	3.5	0.6	9.1	-58.5	Clear	Strong
12:00	25	100	10.54	2250	6.22	0.029	2.5	0.58	9.1	-61.3	Clear	Strong

Constituent Sampled	Container	Number	Preservative
Total Metals (Method 6010C/6020A)	250 mL Plastic	1	HNO3

Comments: None

Well Information

Well Labeled Properly: Yes

Is Well in Good Condition? Yes

Well Inspection Comments: None

ft-bmp = feet below measuring point
 in = inches
 ft = feet
 mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
 NTU = Nephelometric Turbidity Unit
 mg/L = milligrams per liter
 S.U = standard units

Groundwater Sampling Form



Well ID	57M-96-11X	Date	2022-05-04	Event	Spring 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	AOC 57 / Site Wide		
Weather(°F)	48 deg, showers			Field Technician	Spencer Gust		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	2.0-12.0	Casing Diameter (in)	2.0	Well Casing Material	NA
Static Water Level (ft-bmp)	2.74	Total Depth (ft-bmp)		Water Column(ft)	11.98	Gallons in Well	1.95
Depth to Product (ft-bmp)		Pump Intake Depth(ft-bmp)	7	Purge Method	Low-Flow	Purging Equipment	Peristaltic Pump
Purge Start Time	12:52	Total Volume Purged (ml)	1725	Sample ID	NA	Sample Time	13:16
Purge End Time	13:16	Well Volumes Purged (total)	0.23	Replicate / Code No.	Duplicate /	Water Quality Meter/ ID	YSI ProPlus /

Scope of work completed? Yes

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
13:00	0	100	2.74	600	5.86	0.123	349	1.11	9.1	11.6	Reddish Brown	No Odor
13:05	5	100	2.74	975	5.87	0.124	278.3	0.42	9.1	8.4	Reddish Brown	No Odor
13:09	9	100	2.74	1275	5.86	0.124	231.6	0.37	9.1	9.4	Reddish Brown	No Odor
13:15	15	100	2.74	1725	5.86	0.124	183.2	0.32	9.1	9.5	Reddish Brown	No Odor

Constituent Sampled	Container	Number	Preservative
Total Metals (Method 6010C/6020A)	250 mL Plastic	1	HNO3

Comments: None

Well Information

Well Labeled Properly: Yes

Is Well in Good Condition? Yes

Well Inspection Comments: None

ft-bmp = feet below measuring point
 in = inches
 ft = feet
 mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
 NTU = Nephelometric Turbidity Unit
 mg/L = milligrams per liter
 S.U = standard units

SURFACE WATER SAMPLING LOG



Project Number: 30130800	Sample Location: AOC-57	Date: 5/4/2022
Site: Devens	Location: Middlesex MA	Personnel: Spencer Gust
GPS Latitude: 42.5429258	Planned Latitude:	Weather: 48 deg, showers
GPS Longitude: -71.58503157	Planned Longitude:	Event: Spring 2022

ANALYTICAL SAMPLING

Sampling Method: Grab	MS/MSD: No
Sample ID: 57-SW1	Duplicate: No
Sample Time: 10:15	Duplicate ID:
Sample Depth(ft): 0.5	Equipment Blank: No
Water Quality Parameter: YSI ProPlus	Ambient Blank ID: N/A
	Description:

SURFACE WATER FIELD PARAMETERS		SAMPLE INFORMATION				
Parameter measured:	Ex Situ (container)	Analyses	Container	No	Preservative*	Filtered**?
		Dissolved metals	250 mL HDPE Plastic	1	HNO3	yes
Time	10:15					
Temperature (°C)	8.6					
pH	5.04					
ORP (mV)	162.2					
Conductivity (mS/cm)	0.138					
Dissolved Oxygen (mg/L)	0.49					
Turbidity (NTU)	245					
Post-Filter Turbidity (NTU)	N/A					

MISCELLANEOUS OBSERVATIONS
Comments:

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units

Groundwater Sampling Form



Well ID	32M 01-13XBR	Date	2022-05-03	Event	Spring 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	AOC 32/43A		
Weather(°F)	51.1 degrees F and Light Rain. The wind is blowing W at 13.9 mph.			Field Technician	Diane Champagne		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	12.86-22.86	Casing Diameter (in)	2.0	Well Casing Material	PVC
Static Water Level (ft-bmp)	16.43	Total Depth (ft-bmp)		Water Column(ft)	6.85	Gallons in Well	1.11
Depth to Product (ft-bmp)		Pump Intake Depth(ft-bmp)	21	Purge Method	Low-Flow	Purging Equipment	Peristaltic Pump
Purge Start Time	13:30	Total Volume Purged (ml)	10500	Sample ID	32M-01-13XBR-SPR22	Sample Time	14:45
Purge End Time	14:41	Well Volumes Purged (total)	2.50	Replicate / Code No.	Not Applicable /	Water Quality Meter/ ID	YSI Pro DSS / 19j103221

Scope of work completed? Yes

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
13:45	0	150	16.99	2250	6.56	2.195	68.08	7.61	13.4	124.3	Orange	No Odor
13:50	5	150	17.29	3000	6.58	2.176	24.17	7.8	12.9	134.7	Orange	No Odor
13:56	11	150	17.51	3900	6.59	2.168	24.42	7.79	12.7	136.4	Orange	No Odor
14:00	15	150	17.65	4500	6.59	2.179	12.93	7.7	12.8	136.3	Orange	No Odor
14:05	20	150	17.78	5700	6.6	2.2	10.76	7.63	13	135.6	Orange	No Odor
14:10	25	150	17.83	6000	6.59	2.213	7.77	7.57	13.1	135.1	Orange	No Odor
14:15	30	150	17.93	6750	6.59	2.25	27.88	7.48	13.6	132.9	Orange	No Odor
14:20	35	150	17.98	7500	6.59	2.258	29.22	7.49	13.6	132.8	Orange	No Odor
14:26	41	150	18.18	8400	6.59	2.28	6.7	7.34	13.9	133.5	Orange	No Odor
14:31	46	150	19.1	9150	6.51	2.267	7.37	6.76	13.5	136.8	Orange	No Odor
14:35	50	150	19.43	9750	6.51	2.262	6.97	6.55	13.4	138.6	Orange	No Odor
14:40	55	150	19.67	10500	6.51	2.263	7.13	6.67	13.2	137.7	Orange	No Odor

Constituent Sampled	Container	Number	Preservative
MA-VPH	40 mL Glass	3	HCL
VOCs (Method 8260B)	40 mL Glass	3	HCL
Dissolved Metals (Method 6010C/6020A)	250 mL Plastic	1	HNO3

Comments: None

Well Information

Well Labeled Properly: yes

Is Well in Good Condition? no

Well Inspection Comments: none

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units
mS/cm = milliSiemens per centimeter

Groundwater Sampling Form



Well ID	32M-01-14XOB	Date	2022-05-03	Event	Spring 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	AOC 32/43A		
Weather(°F)	52.0 degrees F and Light Rain.		Field Technician	Grace Sheckler			
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	17.36-27.36	Casing Diameter (in)	2.0	Well Casing Material	PVC
Static Water Level (ft-bmp)	23.89	Total Depth (ft-bmp)		Water Column(ft)	6.27	Gallons in Well	1.02
Depth to Product (ft-bmp)		Pump Intake Depth(ft-bmp)	25	Purge Method	Low-Flow	Purging Equipment	Peristaltic Pump
Purge Start Time	10:35	Total Volume Purged (ml)	5130	Sample ID	32M-01-14XOB-SPR22	Sample Time	12:15
Purge End Time	12:10	Well Volumes Purged (total)	1.33	Replicate / Code No.	Not Applicable /	Water Quality Meter/ ID	YSI Pro DSS / 19K102593

Scope of work completed? Yes

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
10:40	0	100	24.06	270	6.03	0.473	35.75	2.21	10.2	105.9	Clear	No Odor
10:44	4	100	24.11	486	6.02	0.467	38.5	1.67	10.3	100.1	Clear	No Odor
10:49	9	100	24.14	756	6.02	0.468	19	1.47	10.5	93.1	Clear	No Odor
10:54	14	100	24.18	1026	6.02	0.469	18.1	1.42	10.5	88.3	Clear	No Odor
11:00	20	100	24.23	1350	6.04	0.47	17.5	1.29	10.6	76.3	Clear	No Odor
11:05	25	100	24.27	1620	6.05	0.472	14.6	1.25	10.7	67.2	Clear	No Odor
11:11	31	100	24.31	1944	6.05	0.473	12.2	1.24	10.7	59.1	Clear	No Odor
11:16	36	100	24.33	2214	6.06	0.472	12.28	1.19	10.7	50.6	Clear	No Odor
11:20	40	100	24.36	2430	6.06	0.472	11.75	1.18	10.7	48.4	Clear	No Odor
11:25	45	100	24.39	2700	6.06	0.473	11.05	1.16	10.8	41.5	Clear	No Odor
11:30	50	100	24.41	2970	6.08	0.476	9.68	1.13	11.2	34.9	Clear	No Odor
11:36	56	100	24.44	3294	6.09	0.481	11.35	1.13	11.4	27.5	Clear	No Odor
11:43	63	100	24.47	3672	6.11	0.483	20.3	1.12	11.4	19.2	Clear	No Odor
11:48	68	100	24.49	3942	6.13	0.483	16.8	1.09	11.5	14.5	Clear	No Odor
11:52	72	100	24.51	4158	6.15	0.482	11.8	1.1	11.3	8.4	Clear	No Odor
11:58	78	100	24.53	4482	6.18	0.482	11.4	1.06	11.4	3.4	Clear	No Odor
12:02	82	100	24.56	4698	6.17	0.481	8.56	1.06	11.2	3.4	Clear	No Odor
12:06	86	100	24.57	4914	6.16	0.481	8.29	1.04	11.3	4.4	Clear	No Odor
12:10	90	100	24.58	5130	6.15	0.482	8.2	1.05	11.4	4.8	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
MA-VPH	40 mL Glass	3	HCL
VOCs (Method 8260B)	40 mL Glass	3	HCL
Dissolved Metals (Method 6010C/6020A)	250 mL Plastic	1	HNO3

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units
mS/cm = milliSiemens per centimeter

Groundwater Sampling Form



Comments: None

Well Information

Well Labeled Properly: yes _____
Is Well in Good Condition? no _____
Well Inspection Comments: none _____

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units
mS/cm = milliSiemens per centimeter

Groundwater Sampling Form



Well ID	32M-01-17XBR	Date	2022-05-03	Event	Spring 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	AOC 32/43A		
Weather(°F)	39.0 degrees F and Clear. The wind is blowing N/NW at 4.7 mph.			Field Technician	Spencer Gust		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	41.4-51.4	Casing Diameter (in)	2.0	Well Casing Material	PVC
Static Water Level (ft-bmp)	24.41	Total Depth (ft-bmp)		Water Column(ft)	30.08	Gallons in Well	4.9
Depth to Product (ft-bmp)		Pump Intake Depth(ft-bmp)	46.4	Purge Method	Low-Flow	Purging Equipment	Portable Bladder
Purge Start Time	14:41	Total Volume Purged (ml)	4760	Sample ID	32M-01-17X	Sample Time	04:20
Purge End Time	03:15	Well Volumes Purged (total)	0.26	Replicate / Code No.	MS/MSD /	Water Quality Meter/ ID	YSI ProPlus / 17E101955

Scope of work completed? Yes

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
14:45	0	140	24.39	560	7.10	0.114	1253.8	0.75	14.4	-49.1	Brown	No odor
14:50	5	140	24.45	1260	7.09	0.115	446.6	0.59	15.0	-33.5	Brown	No odor
14:55	10	140	24.48	1960	7.10	0.109	116	0.64	14.6	-5.1	Clear	No odor
15:00	15	140	24.48	2660	7.10	0.108	55	0.65	15.4	15.6	Clear	No odor
15:05	20	140	24.48	3360	7.10	0.108	41.9	0.64	15.2	32.7	Clear	No odor
15:10	25	140	24.48	3780	7.10	0.109	38.2	0.63	15.3	35.6	Clear	No odor
15:15	30	140	24.48	4760	7.10	0.107	39.2	0.61	15.1	34.2	Clear	No odor

Constituent Sampled	Container	Number	Preservative
MA-VPH	40 mL Glass	3	HCL
VOCs (Method 8260B)	40 mL Glass	3	HCL
Dissolved Metals (Method 6010C/6020A)	250 mL Plastic	1	HNO3

Comments: None

Well Information

Well Labeled Properly: yes

Is Well in Good Condition? yes

Well Inspection Comments: none

ft-bmp = feet below measuring point
 in = inches
 ft = feet
 mL/min = milliliters per minute

NTU = Nephelometric Turbidity Unit
 mg/L = milligrams per liter
 S.U = standard units
 mS/cm = milliSiemens per centimeter

Groundwater Sampling Form



Well ID	32M-01-18XBR	Date	2022-05-03	Event	Spring 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	AOC 32/43A		
Weather(°F)	39.0 degrees F and Clear. The wind is blowing N/NW at 4.7 mph.			Field Technician	Diane Champagne		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	13.43-23.43	Casing Diameter (in)	2.0	Well Casing Material	PVC
Static Water Level (ft-bmp)	16.41	Total Depth (ft-bmp)		Water Column(ft)	7.90	Gallons in Well	1.28
Depth to Product (ft-bmp)		Pump Intake Depth(ft-bmp)	22	Purge Method	Low-Flow	Purging Equipment	Peristaltic Pump
Purge Start Time	12:10	Total Volume Purged (ml)	6000	Sample ID	32M-01-18XBR-SPR22	Sample Time	12:55
Purge End Time	12:51	Well Volumes Purged (total)	1.24	Replicate / Code No.	Duplicate /	Water Quality Meter/ ID	YSI Pro DSS / 19j103221

Scope of work completed? Yes

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
12:15	0	150	16.41	750	6.33	2.469	6.64	5.77	11.6	117.3	Clear	No Odor
12:21	6	150	16.55	1650	6.42	2.709	5.36	4.51	11.7	124.1	Clear	No Odor
12:25	10	150	16.69	2250	6.47	2.773	4.44	4.31	11.8	127.6	Clear	No Odor
12:31	16	150	16.81	3150	6.51	2.83	4.04	4.27	11.9	131.7	Clear	No Odor
12:36	21	150	16.9	3900	6.53	2.854	2.43	4.31	12	132.8	Clear	No Odor
12:40	25	150	16.96	4800	6.53	2.892	2.44	4.29	12.2	133.9	Clear	No Odor
12:47	32	150	16.99	5500	6.54	2.919	2.08	4.31	12.4	135.4	Clear	No Odor
12:50	35	150	17.03	6000	6.54	2.932	2.31	4.33	12.5	137.2	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
MA-VPH	40 mL Glass	3	HCL
VOCs (Method 8260B)	40 mL Glass	3	HCL
Dissolved Metals (Method 6010C/6020A)	250 mL Plastic	1	HNO3

Comments: None

Well Information

Well Labeled Properly: yes

Is Well in Good Condition? yes

Well Inspection Comments: none

ft-bmp = feet below measuring point
 in = inches
 ft = feet
 mL/min = milliliters per minute

NTU = Nephelometric Turbidity Unit
 mg/L = milligrams per liter
 S.U = standard units
 mS/cm = milliSiemens per centimeter

Groundwater Sampling Form



Well ID	LFM-03-07	Date	2022-05-04	Event	Spring 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	DCL / Site Wide		
Weather(°F)	37.9 degrees F and Clear.		Field Technician		Diane Champagne		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	10.0-20.0	Casing Diameter (in)	2.0	Well Casing Material	NA
Static Water Level (ft-bmp)	17.98	Total Depth (ft-bmp)		Water Column(ft)	5.58	Gallons in Well	0.91
Depth to Product (ft-bmp)		Pump Intake Depth(ft-bmp)	21	Purge Method	Low-Flow	Purging Equipment	Peristaltic Pump
Purge Start Time	08:20	Total Volume Purged (ml)	9000	Sample ID	LFM-03-07-SPR22	Sample Time	09:30
Purge End Time	09:21	Well Volumes Purged (total)	2.61	Replicate / Code No.	Not Applicable /	Water Quality Meter/ ID	YSI Pro DSS / 19J103221

Scope of work completed? Yes

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
08:35	0	150	18.51	2250	6.28	0.68	6.72	8.01	9.5	156.9	Clear	No Odor
08:40	5	150	18.51	3000	6.3	0.688	7.12	7.99	9.4	162.6	Clear	No Odor
08:46	11	150	18.51	3900	6.32	0.694	6.91	7.96	9.5	166.1	--	--
08:50	15	150	18.51	4500	6.32	0.697	6.76	8.31	9.5	168.1	--	--
08:55	20	150	18.52	5250	6.32	0.702	6.47	7.91	9.7	171.4	--	--
09:00	25	150	18.51	6000	6.33	0.705	31.93	7.94	9.6	175.8	--	--
09:06	31	150	18.52	6900	6.33	0.705	39.25	8	9.6	177.4	--	--
09:10	35	150	18.53	7800	6.33	0.707	0.91	7.97	9.6	180.3	--	--
09:15	40	150	18.53	8250	6.33	0.708	0.79	7.96	9.7	181.5	--	--
09:20	45	150	18.51	9000	6.33	0.71	0.83	8.04	9.7	182.3	--	--

Constituent Sampled	Container	Number	Preservative
Total Dissolved Solids (SM2540C-11)	1L Plastic	1	None
MA-EPH	1L Amber	2	
Pesticides (Method 8081B)	1L Amber	2	None
MA-VPH	40 mL Glass	3	HCL
Chemical Oxygen Demand (Method 410.4)	250 mL Plastic	1	H2SO4
Alkalinity (SM 2320B)	250 mL Plastic	1	None
Dissolved Metals (Method 6010C/6020A)	250 mL Plastic	1	HNO3
Cyanide (Method 9012B)	250 mL Plastic	1	NaOH
Chloride (Method 9056A)	125 mL Plastic	1	None
Nitrate/Nitrite Nitrogen (EPA 353.2)	500 mL Amber	1	H2SO4
Chemical Oxygen Demand (Method 410.4)	500ml Amber	1	H2SO4

ft-bmp = feet below measuring point
 in = inches
 ft = feet
 mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
 NTU = Nephelometric Turbidity Unit
 mg/L = milligrams per liter
 S.U = standard units

Groundwater Sampling Form



Comments: None measured total depth twice. 23.38 is correct

Well Information

Well Labeled Properly: yes

Is Well in Good Condition? yes

Well Inspection Comments: _____

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units

Groundwater Sampling Form



Well ID	LFM-99-02B	Date	2022-05-04	Event	Spring 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	DCL		
Weather(°F)	39.9 degrees F and Partly Cloudy.		Field Technician	Diane Champagne Grace Sheckler			
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	16.0-26.0	Casing Diameter (in)	2.0	Well Casing Material	PVC
Static Water Level (ft-bmp)	16.35	Total Depth (ft-bmp)		Water Column(ft)	10.21	Gallons in Well	1.66
Depth to Product (ft-bmp)		Pump Intake Depth(ft-bmp)	23	Purge Method	Low-Flow	Purging Equipment	Peristaltic Pump
Purge Start Time	08:40	Total Volume Purged (ml)	4080	Sample ID	LFM-99-02B-SPR22	Sample Time	09:15
Purge End Time	09:06	Well Volumes Purged (total)	0.65	Replicate / Code No.	MS/MSD / LFM-99-02B-SPR22	Water Quality Meter/ ID	YSI Pro DSS / 19K102593

Scope of work completed? Yes

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
08:43	0	170	17.47	510	6.08	0.494	0.62	9.05	9.1	225	Clear	No Odor
08:48	5	170	17.5	1360	6.03	0.507	0.66	8.92	9	237.8	--	--
08:53	10	170	17.5	2210	6.03	0.509	0.71	8.9	9	244.8	Clear	No Odor
08:59	16	170	17.5	3230	6.03	0.506	0.93	8.88	9	250.6	--	--
09:04	21	170	17.5	4080	6.04	0.502	1.08	8.85	9	253.9	--	--

Constituent Sampled	Container	Number	Preservative
Total Dissolved Solids (SM2540C-11)	1L Plastic	1	None
MA-EPH	1L Amber	2	
Pesticides (Method 8081B)	1L Amber	2	None
MA-VPH	40 mL Glass	3	HCL
Chemical Oxygen Demand (Method 410.4)	250 mL Plastic	1	H2SO4
Alkalinity (SM 2320B)	250 mL Plastic	1	None
Dissolved Metals (Method 6010C/6020A)	250 mL Plastic	1	HNO3
Cyanide (Method 9012B)	250 mL Plastic	1	NaOH
Chloride (Method 9056A)	125 mL Plastic	1	None
Nitrate/Nitrite Nitrogen (EPA 353.2)	500 mL Amber	1	H2SO4
Chemical Oxygen Demand (Method 410.4)	500ml Amber	1	H2SO4

Comments: None

Well Information

Well Labeled Properly: yes

Is Well in Good Condition? yes

Well Inspection Comments: _____

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units

Groundwater Sampling Form



Well ID	LFM-99-05A	Date	2022-05-05	Event	Spring 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	DCL / Site Wide		
Weather(°F)				Field Technician	Spencer Gust		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	20.0-30.0	Casing Diameter (in)	2.0	Well Casing Material	NA
Static Water Level (ft-bmp)	22.01	Total Depth (ft-bmp)			Water Column(ft)	0.00	Gallons in Well
Depth to Product (ft-bmp)	Pump Intake Depth(ft-bmp)		25	Purge Method	Low-Flow	Purging Equipment	Peristaltic Pump
Purge Start Time	09:17	Total Volume Purged (ml)	6235	Sample ID	LFM-99-05A-SPR22	Sample Time	10:14
Purge End Time	10:03	Well Volumes Purged (total)			Replicate / Code No.	Duplicate /	Water Quality Meter/ ID YSI Pro DSS / 17E101955

Scope of work completed? Yes

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
09:47	0	145	21.97	4350	6.34	0.089	17.6	3.16	11.1	195	Clear	No Odor
09:55	8	145	21.97	5510	6.33	0.091	16.9	3.13	11.3	196.6	Clear	No Odor
10:00	13	145	21.97	6235	6.33	0.091	17.2	3.06	11.3	195.4	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Total Dissolved Solids (SM2540C-11)	1L Plastic	1	None
MA-EPH	1L Amber	2	
Pesticides (Method 8081B)	1L Amber	2	None
MA-VPH	40 mL Glass	3	HCL
Chemical Oxygen Demand (Method 410.4)	250 mL Plastic	1	H2SO4
Alkalinity (SM 2320B)	250 mL Plastic	1	None
Dissolved Metals (Method 6010C/6020A)	250 mL Plastic	1	HNO3
Cyanide (Method 9012B)	250 mL Plastic	1	NaOH
Chloride (Method 9056A)	125 mL Plastic	1	None
Nitrate/Nitrite Nitrogen (EPA 353.2)	500 mL Amber	1	H2SO4
Chemical Oxygen Demand (Method 410.4)	500ml Amber	1	H2SO4

Comments: 8081B was not on sample list. Changed method from 8081A.

Well Information

Well Labeled Properly: yes

Is Well in Good Condition? yes

Well Inspection Comments: _____

ft-bmp = feet below measuring point
 in = inches
 ft = feet
 mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
 NTU = Nephelometric Turbidity Unit
 mg/L = milligrams per liter
 S.U = standard units

Groundwater Sampling Form



Well ID	LFM 99-06ARP	Date	2022-05-04	Event	Spring 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	DCL		
Weather(°F)	39.9 degrees F and Light Rain.		Field Technician		Diane Champagne		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	19.0-34.0	Casing Diameter (in)	2.0	Well Casing Material	PVC
Static Water Level (ft-bmp)	15.15	Total Depth (ft-bmp)		Water Column(ft)	20.01	Gallons in Well	3.25
Depth to Product (ft-bmp)		Pump Intake Depth(ft-bmp)	32	Purge Method	Low-Flow	Purging Equipment	Peristaltic Pump
Purge Start Time	11:20	Total Volume Purged (ml)	6000	Sample ID	LFM-99-06-ARP-SPR22	Sample Time	12:05
Purge End Time	12:01	Well Volumes Purged (total)	0.49	Replicate / Code No.	Not Applicable /	Water Quality Meter/ ID	YSI Pro DSS / 19J103221

Scope of work completed? Yes

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
11:30	0	150	15.15	1500	6.39	0.82	4.28	6.85	10.7	151.4	Clear	No Odor
11:36	6	150	15.17	2400	6.38	0.818	1.78	6.88	10.6	157.8	Clear	No Odor
11:41	11	150	15.18	3150	6.37	0.82	1.52	6.87	10.6	162.3	Clear	No Odor
11:45	15	150	15.19	3750	6.37	0.818	1.26	6.85	10.5	165.1	Clear	No Odor
11:50	20	150	15.19	4500	6.37	0.819	1.23	6.89	10.5	166.1	Clear	No Odor
11:55	25	150	15.19	5250	6.37	0.82	1.24	6.86	10.5	167.2	Clear	No Odor
12:00	30	150	15.2	6000	6.37	0.82	1.18	6.79	10.5	167.5	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Total Dissolved Solids (SM2540C-11)	1L Plastic	1	None
MA-EPH	1L Amber	2	HCL
Pesticides (Method 8081B)	1L Amber	2	None
MA-VPH	40 mL Glass	3	HCL
Chemical Oxygen Demand (Method 410.4)	250 mL Plastic	1	H2SO4
Alkalinity (SM 2320B)	250 mL Plastic	1	None
Dissolved Metals (Method 6010C/6020A)	250 mL Plastic	1	HNO3
Cyanide (Method 9012B)	250 mL Plastic	1	NaOh
Chloride (Method 9056A)	125 mL Plastic	1	None
Nitrate/Nitrite Nitrogen (EPA 353.2)	500 mL Amber	1	H2SO4
Chemical Oxygen Demand (Method 410.4)	500ml Amber	1	H2SO4

Comments: None

Well Information

Well Labeled Properly: yes
 Is Well in Good Condition? yes
 Well Inspection Comments: _____

ft-bmp = feet below measuring point
 in = inches
 ft = feet
 mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
 NTU = Nephelometric Turbidity Unit
 mg/L = milligrams per liter
 S.U = standard units



Groundwater Sampling Form



Well ID	LFM-99-02B	Date	2022-10-27	Event	Fall 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	DCL / Site Wide		
Weather(°F)	60.1 degrees F and Clear.			Field Technician	Grace Sheckler		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	16.0-26.0	Casing Diameter (in)	2.0	Well Casing Material	NA
Static Water Level (ft-bmp)	19.44	Total Depth (ft-bmp)	NM	Water Column(ft)	6.56	Gallons in Well	1.07
Depth to Product (ft-bmp)	NA	Pump Intake Depth(ft-bmp)	24	Purge Method	Low-Flow	Purging Equipment	Peristaltic Pump
Purge Start Time	10:05	Total Volume Purged (ml)	1762	Sample ID	LFM-99-02B-FAL22	Sample Time	10:25
Purge End Time	10:21	Well Volumes Purged (total)	0.43	Replicate / Code No.	MS/MSD / LFM-99-02B-FAL22	Water Quality Meter/ ID	YSI Pro DSS / 18G101313
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
10:12	0	106	19.52	742	6.49	0.763	3.1	8.71	12.1	222.2	Clear	No Odor
10:15	3	120	19.54	1102	6.48	0.755	2.9	8.66	11.9	226.8	Clear	No Odor
10:20	8	132	19.55	1762	6.48	0.753	2.7	8.68	11.8	230.9	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Total Dissolved Solids (SM2540C-11)	1L Plastic	1	None
MA-EPH	1L Amber	2	HCL
Pesticides (Method 8081B)	1L Amber	2	None
MA-VPH	40 mL Glass	3	HCL
Chemical Oxygen Demand (Method 410.4)	250 mL Plastic	1	H2SO4
Alkalinity (SM 2320B)	250 mL Plastic	1	None
Dissolved Metals (Method 6010C/6020A)	250 mL Plastic	1	HNO3
Cyanide (Method 9012B)	250 mL Plastic	1	NaOH
Chloride (Method 9056A)	125 mL Plastic	1	None
Nitrate/Nitrite Nitrogen (EPA 353.2)	500 mL Amber	1	H2SO4
Chemical Oxygen Demand (Method 410.4)	500ml Amber	1	H2SO4

Comments: None

Well Information

Well Labeled Properly: yes

Is Well in Good Condition? yes

Well Inspection Comments: _____

ft-bmp = feet below measuring point
 in = inches
 ft = feet
 mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
 NTU = Nephelometric Turbidity Unit
 mg/L = milligrams per liter
 S.U = standard units



Groundwater Sampling Form



Well ID	LFM-99-05A	Date	2022-10-27	Event	Fall 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	DCL / Site Wide		
Weather(°F)	61° Sunny. Wind 11mph SE.			Field Technician	Spencer Gust		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	20.0-30.0	Casing Diameter (in)	2.0	Well Casing Material	NA
Static Water Level (ft-bmp)	25.62	Total Depth (ft-bmp)	NM	Water Column(ft)	2.38	Gallons in Well	0.39
Depth to Product (ft-bmp)	NA	Pump Intake Depth(ft-bmp)	28	Purge Method	Low-Flow	Purging Equipment	Peristaltic Pump
Purge Start Time	09:52	Total Volume Purged (ml)	13250	Sample ID	LFM-99-05A-FAL22	Sample Time	11:15
Purge End Time	10:46	Well Volumes Purged (total)	8.97	Replicate / Code No.	Not Applicable /	Water Quality Meter/ ID	YSI Pro DSS /
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
10:17	0	250	25.66	0	6.48	1.193	38.74	7.45	14.6	217.4	Clear	No Odor
10:25	8	250	25.65	8250	6.26	1.171	13.11	6.01	13.6	228.7	Clear	No Odor
10:30	13	250	25.65	9500	6.23	1.174	8.19	5.94	13.6	234.1	Clear	No Odor
10:35	18	250	25.65	10750	6.22	1.174	5.6	5.9	13.4	239.1	Clear	No Odor
10:40	23	250	25.65	12000	6.22	1.178	5.4	5.88	13.5	241.8	Clear	No Odor
10:45	28	250	25.65	13250	6.18	1.18	5.56	5.86	13.8	244.4	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Total Dissolved Solids (SM2540C-11)	1L Plastic	1	None
MA-EPH	1L Amber	2	HCL
Pesticides (Method 8081B)	1L Amber	2	None
MA-VPH	40 mL Glass	3	HCL
Chemical Oxygen Demand (Method 410.4)	250 mL Plastic	1	H2SO4
Alkalinity (SM 2320B)	250 mL Plastic	1	None
Dissolved Metals (Method 6010C/6020A)	250 mL Plastic	1	HNO3
Cyanide (Method 9012B)	250 mL Plastic	1	NaOH
Chloride (Method 9056A)	125 mL Plastic	1	None
Nitrate/Nitrite Nitrogen (EPA 353.2)	500 mL Amber	1	H2SO4
Chemical Oxygen Demand (Method 410.4)	500ml Amber	1	H2SO4

Comments: None

Well Information

Well Labeled Properly: yes

Is Well in Good Condition? yes

Well Inspection Comments: _____

ft-bmp = feet below measuring point
 in = inches
 ft = feet
 mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
 NTU = Nephelometric Turbidity Unit
 mg/L = milligrams per liter
 S.U = standard units



Groundwater Sampling Form



Well ID	LFM 99-06ARP	Date	2022-10-27	Event	Fall 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	DCL / Site Wide		
Weather(°F)	57.9 degrees F and Clear. The wind is blowing NW at 8.1 mph.			Field Technician	Diane Champagne		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	19.0-34.0	Casing Diameter (in)	2.0	Well Casing Material	NA
Static Water Level (ft-bmp)	17.34	Total Depth (ft-bmp)	NM	Water Column(ft)	16.66	Gallons in Well	2.71
Depth to Product (ft-bmp)	NA	Pump Intake Depth(ft-bmp)	26.5	Purge Method	Low-Flow	Purging Equipment	Peristaltic Pump
Purge Start Time	09:05	Total Volume Purged (ml)	14750	Sample ID	LFM—99-06ARP-FAL22	Sample Time	10:10
Purge End Time	10:05	Well Volumes Purged (total)	1.44	Replicate / Code No.	Not Applicable /	Water Quality Meter/ ID	YSI Pro DSS / 21c100564
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
09:15	0	250	17.36	2500	6.4	0.754	2.23	6.8	14.8	115.6	Clear	Slight
09:20	5	250	17.38	3750	6.4	0.752	1.84	6.73	14.8	108.8	Clear	Slight
09:30	15	250	17.38	6250	6.41	0.739	2.38	6.7	14.3	101.2	Clear	Slight
09:35	20	250	17.37	7500	6.41	0.74	3.35	6.61	14.4	102.6	Clear	Slight
09:40	25	250	17.38	8750	6.41	0.737	3.6	6.6	14.4	102.5	Clear	Slight
09:45	30	250	17.38	10000	6.41	0.739	3.71	6.6	14.5	102.7	Clear	Slight
10:00	45	250	17.38	13750	6.42	0.74	4.54	6.58	14.5	103	Clear	Slight
10:04	49	250	17.38	14750	6.42	0.742	4.53	6.57	14.6	102.9	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Total Dissolved Solids (SM2540C-11)	1L Plastic	1	None
MA-EPH	1L Amber	2	HCL
Pesticides (Method 8081B)	1L Amber	2	None
MA-VPH	40 mL Glass	3	HCL
Chemical Oxygen Demand (Method 410.4)	250 mL Plastic	1	H2SO4
Alkalinity (SM 2320B)	250 mL Plastic	1	None
Dissolved Metals (Method 6010C/6020A)	250 mL Plastic	1	HNO3
Cyanide (Method 9012B)	250 mL Plastic	1	NaOH
Chloride (Method 9056A)	125 mL Plastic	1	None
Nitrate/Nitrite Nitrogen (EPA 353.2)	500 mL Amber	1	H2SO4
Chemical Oxygen Demand (Method 410.4)	500ml Amber	1	H2SO4

Comments: None

ft-bmp = feet below measuring point
 in = inches
 ft = feet
 mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
 NTU = Nephelometric Turbidity Unit
 mg/L = milligrams per liter
 S.U. = standard units



Groundwater Sampling Form



Well Information

Well Labeled Properly: yes

Is Well in Good Condition? yes

Well Inspection Comments:

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units



Groundwater Sampling Form



Well ID	AAFES-2	Date	2022-10-31	Event	Fall 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	AOC 43G / Site Wide		
Weather(°F)	48.0 degrees F and Haze. The wind is blowing undefined at 0.0 mph.			Field Technician	Grace Sheckler		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	18.0-33.0	Casing Diameter (in)	2.0	Well Casing Material	NA
Static Water Level (ft-bmp)	23.93	Total Depth (ft-bmp)	NM	Water Column(ft)	9.49	Gallons in Well	1.54
Depth to Product (ft-bmp)	NA	Pump Intake Depth(ft-bmp)	30	Purge Method	Low-Flow	Purging Equipment	Bladder Pump
Purge Start Time	12:24	Total Volume Purged (ml)	6274	Sample ID	AAFES-2-FAL22	Sample Time	13:20
Purge End Time	13:16	Well Volumes Purged (total)	1.08	Replicate / Code No.	Not Applicable /	Water Quality Meter/ ID	YSI Pro DSS / 18G101313
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
12:30	0	134	24.37	804	6.79	1.708	17.6	0.88	16.3	-85.5	Clear	Strong
12:35	5	134	24.65	1474	6.77	1.695	12.4	0.75	16.2	-93.5	Clear	Strong
12:40	10	120	25.09	2074	6.77	1.68	11.3	0.68	15.9	-97.2	Clear	Strong
12:45	15	120	25.22	2674	6.76	1.665	10.6	0.65	15.7	-97.6	Clear	Strong
12:50	20	120	25.38	3274	6.74	1.672	11.8	0.62	15.9	-103	Clear	Strong
12:55	25	120	25.49	3874	6.72	1.672	11.8	0.59	15.8	-97	Clear	Strong
13:00	30	120	25.49	4474	6.72	1.676	8.1	0.58	15.9	-95.1	Clear	Strong
13:05	35	120	25.59	5074	6.74	1.692	5	0.56	16	-98.3	Clear	Strong
13:10	40	120	25.61	5674	6.77	1.711	4.2	0.55	16.2	-102.6	Clear	Strong
13:15	45	120	25.61	6274	6.79	1.741	3.9	0.54	16.4	-105.9	Clear	Strong

Constituent Sampled	Container	Number	Preservative
VPH+BTEX	40 mL Glass	3	HCL
Total Metals	250 mL Plastic	2	HNO3
Alkalinity	250 mL Plastic	2	None

Comments: None

Well Information

Well Labeled Properly: yes

Is Well in Good Condition? no

Well Inspection Comments: _____

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units



Groundwater Sampling Form



Well ID	AAFES-7	Date	2022-10-31	Event	Fall 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	AOC 43G / Site Wide		
Weather(°F)	52° Partly Cloudy, Wind 3 N.			Field Technician	Spencer Gust		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	6.0-16.0	Casing Diameter (in)	2.0	Well Casing Material	NA
Static Water Level (ft-bmp)	10.75	Total Depth (ft-bmp)	NM	Water Column(ft)	6.50	Gallons in Well	1.06
Depth to Product (ft-bmp)	NA	Pump Intake Depth(ft-bmp)	12	Purge Method	Low-Flow	Purging Equipment	Peristaltic Pump
Purge Start Time	10:28	Total Volume Purged (ml)	6200	Sample ID	AAFES-7-FAL22	Sample Time	11:31
Purge End Time	11:31	Well Volumes Purged (total)	1.55	Replicate / Code No.	Not Applicable /	Water Quality Meter/ ID	YSI Pro DSS /
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
10:40	0	100	10.98	1200	6.5	2.374	10.68	1.1	13.6	103.9	Clear	No Odor
10:45	5	100	10.94	1700	6.35	2.267	9.56	1.89	13.6	124.3	Clear	No Odor
10:50	10	100	10.97	2200	6.34	2.21	8.7	2.11	13.6	135.6	Clear	No Odor
10:55	15	100	11.01	2700	6.32	2.178	7.89	2.43	13.9	143.9	Clear	No Odor
11:00	20	100	11.02	3200	6.3	2.154	6.96	2.59	14.2	150.5	Clear	No Odor
11:04	24	100	11.01	3600	6.32	2.127	7.12	3.1	14.3	156.4	Clear	No Odor
11:10	30	100	11.02	4200	6.32	2.102	5.63	3.84	14.1	163.3	Clear	No Odor
11:16	36	100	11.01	4800	6.38	2.082	4.91	5.58	13.9	169.8	Clear	No Odor
11:20	40	100	11.01	5200	6.38	2.076	4.85	6.36	13.9	173.6	Clear	No Odor
11:25	45	100	11.01	5700	6.38	2.076	4.94	6.37	13.9	176.8	Clear	No Odor
11:30	50	100	11.01	6200	6.38	2.077	4.88	6.85	14	179.6	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Total Metals	250 mL Plastic	2	HNO3

Comments: None

Well Information

Well Labeled Properly: yes

Is Well in Good Condition? yes

Well Inspection Comments: _____

ft-bmp = feet below measuring point
 in = inches
 ft = feet
 mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
 NTU = Nephelometric Turbidity Unit
 mg/L = milligrams per liter
 S.U = standard units



Groundwater Sampling Form



Well ID	XGM-93-02X	Date	2022-10-31	Event	Fall 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	AOC 43G / Site Wide		
Weather(°F)	59.0 degrees F and Mostly Cloudy. The wind is blowing W at 9.2 mph.			Field Technician	Diane Champagne		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	28.0-38.0	Casing Diameter (in)	4.0	Well Casing Material	NA
Static Water Level (ft-bmp)	29.83	Total Depth (ft-bmp)	NM	Water Column(ft)	8.17	Gallons in Well	5.34
Depth to Product (ft-bmp)	NA	Pump Intake Depth(ft-bmp)	35	Purge Method	Low-Flow	Purging Equipment	Bladder Pump
Purge Start Time	11:45	Total Volume Purged (ml)	15000	Sample ID	XGM-93-02X-FAL22	Sample Time	13:05
Purge End Time	13:01	Well Volumes Purged (total)	0.74	Replicate / Code No.	Not Applicable /	Water Quality Meter/ ID	YSI Pro DSS / 21c100564
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
11:55	0	200	29.93	2000	6.71	1.238	80.26	4.07	14.9	-62.1	Orange	Moderate
12:00	5	200	29.99	3000	6.74	1.195	34.03	1.95	14.3	-74.3	Orange	Moderate
12:05	10	200	30.11	4000	6.73	1.194	31.26	1.62	14.5	-73.3	Orange	Moderate
12:10	15	200	30.16	5000	6.69	1.189	27.27	1.43	14.5	-67.4	Orange	Moderate
12:15	20	200	30.23	6000	6.64	1.186	26.17	1.33	14.5	-59.1	Orange	Moderate
12:20	25	200	30.36	7000	6.6	1.183	24.04	1.25	14.4	-49.8	Orange	Moderate
12:25	30	200	30.47	8000	6.55	1.181	25.2	1.2	14.5	-40.1	Orange	Moderate
12:30	35	200	30.58	9000	6.52	1.18	23.27	1.16	14.5	-31.5	Orange	Moderate
12:35	40	200	30.68	10000	6.47	1.189	17.61	1.19	14.5	-20.2	Orange	Moderate
12:40	45	200	30.77	11000	6.46	1.189	16.51	1.18	14.5	-16.1	Orange	Moderate
12:45	50	200	30.96	12000	6.46	1.191	15.83	1.16	14.5	-16	Orange	Moderate
12:50	55	200	31.17	13000	6.47	1.193	14.51	1.13	14.5	-17.8	Orange	Moderate
12:55	60	200	31.24	14000	6.49	1.196	13.28	1.1	14.5	-22	Orange	Moderate
13:00	65	200	31.5	15000	6.49	1.198	13.11	1.08	14.4	-24.4	Orange	Moderate

Constituent Sampled	Container	Number	Preservative
VPH+BTEX	40 mL Glass	3	HCL
Total Metals	250 mL Plastic	2	HNO3
Alkalinity	250 mL Plastic	2	None

Comments: None

Well Information

Well Labeled Properly: yes

Is Well in Good Condition? yes

Well Inspection Comments: _____

ft-bmp = feet below measuring point
 in = inches
 ft = feet
 mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
 NTU = Nephelometric Turbidity Unit
 mg/L = milligrams per liter
 S.U = standard units



Groundwater Sampling Form



Well ID	XGM-94-04X	Date	2022-10-31	Event	Fall 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	AOC 43G / Site Wide		
Weather(°F)	48.0 degrees F and Haze. The wind is blowing undefined at 0.0 mph.			Field Technician	Grace Sheckler		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	18.0-28.0	Casing Diameter (in)	4.0	Well Casing Material	NA
Static Water Level (ft-bmp)	20.6	Total Depth (ft-bmp)	NM	Water Column(ft)	10.49	Gallons in Well	6.82
Depth to Product (ft-bmp)	NA	Pump Intake Depth(ft-bmp)	24	Purge Method	Low-Flow	Purging Equipment	Peristaltic Pump
Purge Start Time	10:10	Total Volume Purged (ml)	7000	Sample ID	XGM-94-04X-FAL22	Sample Time	11:05
Purge End Time	11:00	Well Volumes Purged (total)	0.27	Replicate / Code No.	MS/MSD / XGM-94-04X-FAL22	Water Quality Meter/ ID	YSI Pro DSS / 18G101313
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
10:15	0	140	20.78	700	7.14	1.695	11.6	1.31	14.7	-106.9	Clear	Strong
10:20	5	140	20.81	1400	7.21	1.705	9.3	1.03	14.6	-125.5	Clear	Strong
10:25	10	140	20.83	2100	7.24	1.717	8.2	0.9	14.7	-131.7	Clear	Strong
10:30	15	140	20.85	2800	7.26	1.722	8.3	0.83	14.8	-135	Clear	Strong
10:35	20	140	20.86	3500	7.28	1.716	8.8	0.79	14.6	-137.5	Clear	Strong
10:40	25	140	20.87	4200	7.27	1.723	5	0.76	14.8	-138.2	Clear	Strong
10:45	30	140	20.87	4900	7.28	1.742	5.1	0.74	15	-138.7	Clear	Strong
10:50	35	140	20.87	5600	7.29	1.72	4.6	0.74	14.5	-139	Clear	Strong
10:55	40	140	20.88	6300	7.28	1.712	5	0.73	14.5	-138.5	Clear	Strong
11:00	45	140	20.88	7000	7.28	1.716	4.5	0.71	14.6	-138.5	Clear	Strong

Constituent Sampled	Container	Number	Preservative
VPH+BTEX	40 mL Glass	3	HCL
Total Metals	250 mL Plastic	2	HNO3
Alkalinity	250 mL Plastic	2	None

Comments: None

Well Information

Well Labeled Properly: yes

Is Well in Good Condition? yes

Well Inspection Comments: Surrounded by trees, have to crawl into well and can't stand up

ft-bmp = feet below measuring point
 in = inches
 ft = feet
 mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
 NTU = Nephelometric Turbidity Unit
 mg/L = milligrams per liter
 S.U. = standard units



Groundwater Sampling Form



Well ID	XGM-97-12X	Date	2022-10-31	Event	Fall 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	AOC 43G / Site Wide		
Weather(°F)	48.0 degrees F and Haze. The wind is blowing undefined at 0.0 mph.			Field Technician	Diane Champagne		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	24.0-34.0	Casing Diameter (in)	4.0	Well Casing Material	NA
Static Water Level (ft-bmp)	26.63	Total Depth (ft-bmp)	NM	Water Column(ft)	7.37	Gallons in Well	4.81
Depth to Product (ft-bmp)	NA	Pump Intake Depth(ft-bmp)	32	Purge Method	Low-Flow	Purging Equipment	Bladder Pump
Purge Start Time	09:40	Total Volume Purged (ml)	13000	Sample ID	XGM-97-12X-FAL22	Sample Time	10:50
Purge End Time	10:46	Well Volumes Purged (total)	0.71	Replicate / Code No.	Not Applicable /	Water Quality Meter/ ID	YSI Pro DSS / 21c100564
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
09:45	0	200	27.02	2000	6.68	8.806	4.61	1.73	14.3	-89.7	Yellow	Moderate
09:51	6	200	27.15	2200	6.75	6.453	4.56	1.45	14.5	-97.8	Yellow	Moderate
09:55	10	200	27.3	3000	6.76	5.027	4.18	1.35	14.5	-100.9	Yellow	Moderate
10:00	15	200	27.45	4000	6.78	3.604	3.06	1.24	14.5	-103.1	Yellow	Moderate
10:06	21	200	27.48	5200	6.79	2.513	2.52	1.15	14.6	-106	Yellow	Moderate
10:10	25	200	27.56	6000	6.79	2.139	2.15	1.11	14.6	-107.3	Yellow	Moderate
10:15	30	200	27.58	7000	6.78	1.831	1.88	1.07	14.6	-108.2	Yellow	Moderate
10:20	35	200	27.62	8000	6.78	1.594	1.73	1.04	14.7	-109.1	Yellow	Moderate
10:25	40	200	27.67	9000	6.77	1.501	2.04	1.02	14.7	-109.3	Yellow	Moderate
10:30	45	200	27.71	10000	6.76	1.475	1.77	0.99	14.8	-109.7	Yellow	Moderate
10:35	50	200	27.75	11000	6.76	1.432	1.7	0.97	14.8	-110.1	Yellow	Moderate
10:40	55	200	27.81	12000	6.76	1.431	1.53	0.95	14.8	-110.1	Orange	Moderate
10:45	60	200	27.84	13000	6.75	1.429	1.75	0.94	14.8	-110.3	Yellow	Moderate

Constituent Sampled	Container	Number	Preservative
VPH+BTEX	40 mL Glass	3	HCL
Total Metals	250 mL Plastic	2	HNO3
Alkalinity	250 mL Plastic	2	None

Comments: None

Well Information

Well Labeled Properly: no

Is Well in Good Condition? yes

Well Inspection Comments: _____

ft-bmp = feet below measuring point
 in = inches
 ft = feet
 mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
 NTU = Nephelometric Turbidity Unit
 mg/L = milligrams per liter
 S.U. = standard units



Groundwater Sampling Form



Well ID	69W-94-13	Date	2022-11-01	Event	Fall 2022 LTM
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	AOC 69W / Site Wide
Weather(°F)	57.0 degrees F and Fog/Mist.		Field Technician		Diane Champagne
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	7.0-17.0	Casing Diameter (in)	4 Well Casing Material NA
Static Water Level (ft-bmp)	8.53	Total Depth (ft-bmp)	NM	Water Column(ft)	7.67 Gallons in Well 1.25
Depth to Product (ft-bmp)	N/A	Pump Intake Depth(ft-bmp)	14	Purge Method	Low-Flow Purging Equipment Peristaltic Pump
Purge Start Time	10:10	Total Volume Purged (ml)	6000	Sample ID	69W-94-13-FAL22 Sample Time 10:55
Purge End Time	10:51	Well Volumes Purged (total)	1.27	Replicate / Code No.	Not Applicable / Water Quality Meter/ ID YSI Pro DSS / 21c100564
Scope of work completed?	Yes				

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
10:20	0	150	8.68	1500	6.53	1.07	49.62	2.29	16	38	Clear	Slight
10:25	5	150	8.65	2550	6.53	1.034	45.18	1.72	16.1	25.3	Clear	Slight
10:30	10	150	8.65	3000	6.53	1.025	42.49	1.65	16.1	23.4	Clear	Slight
10:35	15	150	8.66	3750	6.53	1.014	41.21	1.52	16.1	19.9	Clear	Slight
10:40	20	150	8.65	4500	6.53	1.01	40.43	1.41	16.2	18.9	Clear	Slight
10:46	26	150	8.64	5400	6.53	1.013	43.56	1.34	16.1	18.8	Clear	Slight
10:50	30	150	8.64	6000	6.52	1.01	40.36	1.29	16.1	17.9	Clear	Slight

Constituent Sampled	Container	Number	Preservative
EPH+PAHs	1L Amber	2	HCL
Metals	250 mL Plastic	1	HNO3

Comments:

Well Information

Well Labeled Properly: yes

Is Well in Good Condition? yes

Well Inspection Comments: _____

ft-bmp = feet below measuring point
 in = inches
 ft = feet
 mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
 NTU = Nephelometric Turbidity Unit
 mg/L = milligrams per liter
 S.U = standard units



Groundwater Sampling Form



Well ID	69W-94-14	Date	2022-11-01	Event	Fall 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	AOC 69W / Site Wide		
Weather(°F)	57.0 degrees F and Fog/Mist.			Field Technician	Grace Sheckler		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	3.0-13.0	Casing Diameter (in)	2.0	Well Casing Material	NA
Static Water Level (ft-bmp)	9.47	Total Depth (ft-bmp)	NM	Water Column(ft)	5.77	Gallons in Well	0.94
Depth to Product (ft-bmp)	N/A	Pump Intake Depth(ft-bmp)	10	Purge Method	Low-Flow	Purging Equipment	Peristaltic Pump
Purge Start Time	10:29	Total Volume Purged (ml)	4774	Sample ID	69W-94-14X-FAL22	Sample Time	11:05
Purge End Time	11:01	Well Volumes Purged (total)	1.34	Replicate / Code No.	Not Applicable /	Water Quality Meter/ ID	YSI Pro DSS / 18G101313
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
10:35	0	154	9.68	924	5.92	1.134	32.7	4.93	15	209.7	Orange	Slight
10:40	5	154	9.68	1694	5.93	1.131	17.1	4.25	15	215.6	Clear	Slight
10:45	10	154	9.68	2464	5.94	1.136	9.17	3.77	15	223.1	Clear	Slight
10:50	15	154	9.68	3234	5.94	1.138	12.3	3.42	15	228.9	Clear	Slight
10:55	20	154	9.68	4004	5.95	1.139	13.4	3.23	15	233.5	Clear	Slight
11:00	25	154	9.68	4774	5.95	1.142	12.5	3.11	15	235.7	Clear	Slight

Constituent Sampled	Container	Number	Preservative
EPH+PAHs	1L Amber	2	HCL
Metals	250 mL Plastic	1	HNO3

Comments: None

Well Information

Well Labeled Properly: yes

Is Well in Good Condition? yes

Well Inspection Comments: _____

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units



Groundwater Sampling Form



Well ID	69WP-08-01	Date	2022-11-01	Event	Fall 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	AOC 69W / Site Wide		
Weather(°F)	59° Cloudy, 3mph NE.			Field Technician	Spencer Gust		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	10.0-13.0	Casing Diameter (in)	1.0	Well Casing Material	NA
Static Water Level (ft-bmp)	4.55	Total Depth (ft-bmp)	NM	Water Column(ft)	8.00	Gallons in Well	0.32
Depth to Product (ft-bmp)	N/A	Pump Intake Depth(ft-bmp)	12	Purge Method	Low-Flow	Purging Equipment	Peristaltic Pump
Purge Start Time	13:03	Total Volume Purged (ml)	5200	Sample ID	69WP-13-01-FAL22	Sample Time	13:57
Purge End Time	13:56	Well Volumes Purged (total)	4.29	Replicate / Code No.	Not Applicable /	Water Quality Meter/ ID	YSI Pro DSS /
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
13:20	0	100	4.78	1700	7.2	0.595	77.11	1.47	14.8	15.5	Clear	No Odor
13:25	5	100	4.78	2200	7.27	0.596	79.04	1.4	14.8	-6.5	Clear	No Odor
13:30	10	100	4.78	2700	6.95	0.876	29.11	1.18	14.8	-66.8	Clear	No Odor
13:35	15	100	4.79	3200	6.79	0.984	21.77	1.1	14.9	-74.9	Clear	No Odor
13:40	20	100	4.78	3700	6.72	1.04	13.76	1.06	15	-76.1	Clear	No Odor
13:45	25	100	4.78	4200	6.65	1.034	12.11	1.05	15	-69.6	Clear	No Odor
13:50	30	100	4.78	4700	6.62	1.048	12.63	1.04	15	-64.8	Clear	No Odor
13:55	35	100	4.78	5200	6.58	1.041	12.04	1.04	15	-64	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Metals	250 mL Plastic	1	HNO3

Comments: None

Well Information

Well Labeled Properly: yes

Is Well in Good Condition? yes

Well Inspection Comments: _____

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units



Groundwater Sampling Form



Well ID	69WP-13-01	Date	2022-11-01	Event	Fall 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	AOC 69W / Site Wide		
Weather(°F)	59° Cloudy, 3mph NE.			Field Technician	Spencer Gust		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	10.0-13.0	Casing Diameter (in)	1.0	Well Casing Material	NA
Static Water Level (ft-bmp)	3.9	Total Depth (ft-bmp)	NM	Water Column(ft)	8.54	Gallons in Well	0.35
Depth to Product (ft-bmp)	N/A	Pump Intake Depth(ft-bmp)	12	Purge Method	Low-Flow	Purging Equipment	Peristaltic Pump
Purge Start Time	11:32	Total Volume Purged (ml)	4300	Sample ID	69WP-13-01-FAL22	Sample Time	12:17
Purge End Time	12:16	Well Volumes Purged (total)	3.25	Replicate / Code No.	Not Applicable /	Water Quality Meter/ ID	YSI Pro DSS /
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
11:41	0	100	4.21	900	5.83	1.003	105.26	5.21	16.4	17	Clear	No Odor
11:50	9	100	4.2	1800	6.3	1.023	77.56	2.21	14.8	-43.9	Clear	No Odor
11:55	14	100	4.2	2300	6.33	1.008	73.92	1.7	14.8	-56.5	Clear	No Odor
12:00	19	100	4.2	2800	6.36	1	67.38	1.5	14.8	-67.4	Clear	No Odor
12:05	24	100	4.2	3300	6.38	0.998	68.9	1.25	14.8	-82.6	Clear	No Odor
12:10	29	100	4.2	3800	6.4	0.99	63.27	1.27	14.8	-83.9	Clear	No Odor
12:15	34	100	4.2	4300	6.42	0.987	59.41	1.21	14.8	-91.7	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
Metals	250 mL Plastic	1	HNO3

Comments: None

Well Information

Well Labeled Properly: yes

Is Well in Good Condition? yes

Well Inspection Comments: _____

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units



Groundwater Sampling Form



Well ID	ZWM 01-25X	Date	2022-11-01	Event	Fall 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	AOC 69W / Site Wide		
Weather(°F)	59° Cloudy, 3mph NE.			Field Technician	Spencer Gust		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	4.0-14.0	Casing Diameter (in)	2.0	Well Casing Material	NA
Static Water Level (ft-bmp)	7.44	Total Depth (ft-bmp)	NM	Water Column(ft)	8.70	Gallons in Well	1.41
Depth to Product (ft-bmp)	N/A	Pump Intake Depth(ft-bmp)	11	Purge Method	Low-Flow	Purging Equipment	Peristaltic Pump
Purge Start Time	14:41	Total Volume Purged (ml)	2400	Sample ID	NA	Sample Time	15:06
Purge End Time	15:06	Well Volumes Purged (total)	0.45	Replicate / Code No.	Not Applicable /	Water Quality Meter/ ID	YSI Pro DSS /
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (uS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
14:51	0	100	7.51	1000	6.13	0.889	15.85	7.02	15.8	113.2	Clear	No Odor
14:55	4	100	7.51	1400	6.04	0.882	5.19	6.7	15.6	138	Clear	No Odor
14:59	8	100	7.51	1800	6.04	0.881	5.12	6.38	15.5	140.9	Clear	No Odor
15:05	14	100	7.51	2400	6.05	0.881	4.82	6.18	15.5	145.6	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
EPH+PAHs	1L Amber	2	HCL
Metals	250 mL Plastic	1	HNO3

Comments: None

Well Information

Well Labeled Property: yes

Is Well in Good Condition? yes

Well Inspection Comments: _____

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units



Groundwater Sampling Form



Well ID	ZWM-01-26X	Date	11/3/2022	Event	Fall 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	AOC 69W / Site Wide		
Weather(°F)	59° Cloudy, 3mph NE.			Field Technician	Diane Champagne		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	4.0-14.0	Casing Diameter (in)	2.0	Well Casing Material	NA
Static Water Level (ft-bmp)	8.83	Total Depth (ft-bmp)	NM	Water Column(ft)		Gallons in Well	
Depth to Product (ft-bmp)	N/A	Pump Intake Depth(ft-bmp)		Purge Method		Purging Equipment	
Purge Start Time		Total Volume Purged (ml)		Sample ID		Sample Time	
Purge End Time		Well Volumes Purged (total)		Replicate / Code No.	Not Applicable /	Water Quality Meter/ ID	YSI Pro DSS /
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
8:32			8.83		5.88	0.452	19.04	7.39	9.7	259.3	clear	no odor

Constituent Sampled	Container	Number	Preservative
None - field parameters only			

Comments: None

Well Information

Well Labeled Properly: yes

Is Well in Good Condition? yes

Well Inspection Comments: _____

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units



Groundwater Sampling Form



Well ID	ZWM-95-15X	Date	2022-11-01	Event	Fall 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	AOC 69W / Site Wide		
Weather(°F)	55.9 degrees F and Fog/Mist.			Field Technician	Grace Sheckler		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	6.0-16.0	Casing Diameter (in)	4.0	Well Casing Material	NA
Static Water Level (ft-bmp)	7.45	Total Depth (ft-bmp)	NM	Water Column(ft)	7.29	Gallons in Well	4.74
Depth to Product (ft-bmp)	N/A	Pump Intake Depth(ft-bmp)	12	Purge Method	Low-Flow	Purging Equipment	Peristaltic Pump
Purge Start Time	11:39	Total Volume Purged (ml)	8610	Sample ID	ZWM-95-15X-FAL22	Sample Time	12:35
Purge End Time	12:30	Well Volumes Purged (total)	0.48	Replicate / Code No.	Not Applicable /	Water Quality Meter/ ID	YSI Pro DSS / 18G101313
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
11:45	0	160	7.71	960	5.73	1.147	14.9	2.29	13.9	155.3	Clear	No Odor
11:50	5	170	7.76	1810	5.72	1.148	13.4	2.15	13.9	171.8	Clear	No Odor
11:55	10	170	7.77	2660	5.72	1.152	13.6	2.11	13.9	171.1	Clear	No Odor
12:00	15	170	7.77	3510	5.72	1.156	13.6	2.07	13.9	154.7	Clear	No Odor
12:05	20	170	7.77	4360	5.73	1.161	13.4	2.01	13.8	133.4	Clear	No Odor
12:10	25	170	7.77	5210	5.74	1.167	17.3	1.95	13.9	119.6	Clear	No Odor
12:15	30	170	7.77	6060	5.75	1.172	12.8	1.87	13.8	112.1	Clear	No Odor
12:20	35	170	7.77	6910	5.75	1.176	12.4	1.83	13.8	103.8	Clear	No Odor
12:25	40	170	7.77	7760	5.77	1.182	13.5	1.72	13.8	95.2	Clear	No Odor
12:30	45	170	7.77	8610	5.77	1.193	12.8	1.66	13.9	94.1	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
EPH+PAHs	1L Amber	2	HCL
Metals	250 mL Plastic	1	HNO3

Comments: None

Well Information

Well Labeled Properly: yes

Is Well in Good Condition? yes

Well Inspection Comments: _____

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units



Groundwater Sampling Form



Well ID	ZWM-95-18X	Date	2022-11-02	Event	Fall 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	AOC 69W / Site Wide		
Weather(°F)	59° Cloudy, 3mph NE.			Field Technician	Spencer Gust		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	5.0-15.0	Casing Diameter (in)	4.0	Well Casing Material	NA
Static Water Level (ft-bmp)	5.54	Total Depth (ft-bmp)	NM	Water Column(ft)	9.77	Gallons in Well	6.35
Depth to Product (ft-bmp)	N/A	Pump Intake Depth(ft-bmp)	12	Purge Method	Low-Flow	Purging Equipment	Peristaltic Pump
Purge Start Time	13:47	Total Volume Purged (ml)	5750	Sample ID	ZWM-95-18X-FAL22	Sample Time	14:12
Purge End Time	14:11	Well Volumes Purged (total)	0.24	Replicate / Code No.	MS/MSD /	Water Quality Meter/ ID	YSI Pro DSS / 19K102593
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
13:55	0	250	5.52	2000	5.82	1.113	3.77	4.63	15	214.7	Clear	No Odor
14:00	5	250	5.52	3250	5.82	1.115	4.14	4.53	15	220.5	Clear	No Odor
14:05	10	250	5.52	4500	5.87	1.115	3.25	4.47	14.9	226.2	Clear	No Odor
14:10	15	250	5.52	5750	5.89	1.113	3.52	4.47	15.2	229.7	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
EPH+PAHs	1L Amber	2	HCL
Metals	250 mL Plastic	1	HNO3

Comments: None

Well Information

Well Labeled Property: yes

Is Well in Good Condition? yes

Well Inspection Comments: _____

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units



Groundwater Sampling Form



Well ID	ZWM-99-22X	Date	2022-11-01	Event	Fall 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	AOC 69W / Site Wide		
Weather(°F)	57.0 degrees F and Light Rain.			Field Technician	Diane Champagne		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	4.0-14.0	Casing Diameter (in)	2.0	Well Casing Material	NA
Static Water Level (ft-bmp)	7.71	Total Depth (ft-bmp)	NM	Water Column(ft)	6.40	Gallons in Well	1.04
Depth to Product (ft-bmp)	N/A	Pump Intake Depth(ft-bmp)	12	Purge Method	Low-Flow	Purging Equipment	Peristaltic Pump
Purge Start Time	08:05	Total Volume Purged (ml)	3500	Sample ID	ZWM-99-22X-FAL22	Sample Time	08:45
Purge End Time	08:42	Well Volumes Purged (total)	0.89	Replicate / Code No.	Not Applicable /	Water Quality Meter/ ID	YSI Pro DSS / 21c100564
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
08:10	0	100	7.83	500	6.6	0.667	18.26	3.4	16.1	-48.3	Black	Moderate
08:15	5	100	7.81	1000	6.46	0.704	9.45	2.07	16.5	-58.9	Black	Moderate
08:20	10	100	7.81	1500	6.45	0.721	8.12	1.81	16.8	-65.1	Black	Moderate
08:25	15	100	7.81	2000	6.47	0.733	8.16	1.56	16.7	-71.6	Black	Moderate
08:30	20	100	7.81	2500	6.47	0.734	6.23	1.53	16.7	-72.6	Black	Moderate
08:35	25	100	7.81	3000	6.48	0.733	6.42	1.42	16.6	-74.5	Black	Moderate
08:40	30	100	7.82	3500	6.48	0.738	6.61	1.38	16.6	-74.9	Black	Moderate

Constituent Sampled	Container	Number	Preservative
EPH+PAHs	1L Amber	2	HCL
Metals	250 mL Plastic	1	HNO3

Comments: None

Well Information

Well Labeled Properly: no

Is Well in Good Condition? no

Well Inspection Comments: _____

ft-bmp = feet below measuring point
 in = inches
 ft = feet
 mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
 NTU = Nephelometric Turbidity Unit
 mg/L = milligrams per liter
 S.U = standard units



Groundwater Sampling Form



Well ID	ZWM-99-23X	Date	2022-11-01	Event	Fall 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	AOC 69W / Site Wide		
Weather(°F)	55.9 degrees F and Fog/Mist.			Field Technician	Grace Sheckler		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	5.0-15.0	Casing Diameter (in)	2.0	Well Casing Material	NA
Static Water Level (ft-bmp)	7.32	Total Depth (ft-bmp)	NM	Water Column(ft)	7.88	Gallons in Well	1.28
Depth to Product (ft-bmp)	N/A	Pump Intake Depth(ft-bmp)	12	Purge Method	Low-Flow	Purging Equipment	Peristaltic Pump
Purge Start Time	13:44	Total Volume Purged (ml)	6808	Sample ID	ZWM-99-23X-FAL22	Sample Time	14:35
Purge End Time	14:30	Well Volumes Purged (total)	1.41	Replicate / Code No.	Not Applicable /	Water Quality Meter/ ID	YSI Pro DSS / 18G101313
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
13:50	0	148	7.36	888	6.45	0.911	18.9	1.13	14.9	67.5	Clear	No Odor
13:55	5	148	7.37	1628	6.42	0.918	13.3	1.27	15	76.5	Clear	No Odor
14:00	10	148	7.37	2368	6.41	0.921	12.7	1.47	15	76.5	Clear	No Odor
14:05	15	148	7.37	3108	6.41	0.921	7.7	1.39	14.9	74.9	Clear	No Odor
14:10	20	148	7.37	3848	6.41	0.921	7.4	1.48	14.9	70.4	Clear	No Odor
14:15	25	148	7.37	4588	6.41	0.919	7.7	1.56	14.9	66.5	Clear	No Odor
14:20	30	148	7.37	5328	6.41	0.919	6.8	1.76	14.9	62.6	Clear	No Odor
14:25	35	148	7.37	6068	6.42	0.92	6.4	1.83	14.9	57.6	Clear	No Odor
14:30	40	148	7.37	6808	6.42	0.919	6.3	1.85	14.9	54.4	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
EPH+PAHs	1L Amber	2	HCL
Metals	250 mL Plastic	1	HNO3

Comments: None

Well Information

Well Labeled Properly: yes

Is Well in Good Condition? yes

Well Inspection Comments: _____

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units



Groundwater Sampling Form



Well ID	ZWM-99-24X	Date	2022-11-01	Event	Fall 2022 LTM		
Project Name	Fort Devens	Site Location	Devens, MA	Site ID / Operational Area	AOC 69W / Site Wide		
Weather(°F)	57.0 degrees F and Fog/Mist.			Field Technician	Diane Champagne		
Measuring Pt. Description	Top of Inner Casing	Screen Setting (ft-bmp)	6.0-16.0	Casing Diameter (in)	2.0	Well Casing Material	NA
Static Water Level (ft-bmp)	7.69	Total Depth (ft-bmp)	NM	Water Column(ft)	8.21	Gallons in Well	1.33
Depth to Product (ft-bmp)	N/A	Pump Intake Depth(ft-bmp)	13	Purge Method	Low-Flow	Purging Equipment	Peristaltic Pump
Purge Start Time	12:15	Total Volume Purged (ml)	15900	Sample ID	ZWM-99-24x-FAL22	Sample Time	14:05
Purge End Time	14:02	Well Volumes Purged (total)	3.16	Replicate / Code No.	Not Applicable /	Water Quality Meter/ ID	YSI Pro DSS / 21c100564
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Rate (mL/min)	Depth to Water (ft)	Volume Purged (mL)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Redox (mV)	Appearance	
											Color	Odor
12:20	0	150	7.73	750	6.59	0.564	47.33	4.65	15.3	76.7	Orange	Slight
12:25	5	150	7.76	1500	5.64	0.56	33.89	3.24	15.1	119.5	Orange	Slight
12:30	10	150	7.75	2250	5.6	0.56	28.83	3.04	15.2	137	Orange	Slight
12:36	16	150	7.75	3150	5.6	0.561	21.7	2.91	15.1	146.3	Orange	Slight
12:40	20	150	7.75	3750	5.6	0.561	17.17	2.95	15.1	152.8	Orange	Slight
12:45	25	150	7.75	4500	5.6	0.56	14.25	2.97	15.1	155.4	Orange	Slight
12:50	30	150	7.75	5250	5.6	0.558	9.77	2.95	15.1	161.3	Orange	Slight
12:55	35	150	7.75	6000	5.6	0.555	7.24	2.91	15	162.4	Orange	Slight
13:00	40	150	7.75	6750	5.6	0.553	7.02	2.82	15	165.7	Orange	Slight
13:05	45	150	7.75	7500	5.6	0.549	4.22	2.79	14.9	168.8	Orange	Slight
13:10	50	150	7.75	8250	5.61	0.546	3.4	2.74	14.9	174.9	Orange	Slight
13:15	55	150	7.75	9000	5.61	0.544	5.09	2.72	15	177.8	Orange	Slight
13:20	60	150	7.75	9750	5.61	0.542	2.42	2.69	14.9	182.8	Orange	Slight
13:25	65	150	7.75	10500	5.61	0.541	5.33	2.66	14.9	184.7	Orange	Slight
13:30	70	150	7.75	11250	5.61	0.541	2.07	2.63	15.1	186.5	Orange	Slight
13:35	75	150	7.75	12000	5.62	0.537	2.02	2.61	15	190	Orange	Slight
13:40	80	150	7.74	12750	5.62	0.537	6.67	2.53	15.1	192.5	Orange	Slight
13:45	85	150	7.74	13500	5.62	0.535	6.62	2.52	15.1	194.2	Orange	Slight
13:50	90	150	7.74	14250	5.62	0.534	1.45	2.51	15.1	196.5	Orange	Slight
13:55	95	150	7.74	15000	5.62	0.534	1.31	2.49	15.1	198.3	Orange	Slight
14:01	101	150	7.75	15900	5.63	0.534	1.19	2.47	15.2	200.2	Yellow	Slight

Constituent Sampled	Container	Number	Preservative
EPH+PAHs	1L Amber	2	HCL
Metals	250 mL Plastic	1	HNO3

ft-bmp = feet below measuring point
 in = inches
 ft = feet
 mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
 NTU = Nephelometric Turbidity Unit
 mg/L = milligrams per liter
 S.U = standard units



Groundwater Sampling Form



Comments: None

Well Information

Well Labeled Properly: yes

Is Well in Good Condition? yes

Well Inspection Comments:

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	USACE NE Devens TO Y3 8a JV
PROJECT NUMBER	30130800
MODEL	["YSI ProDSS"]
SERIAL NUMBER	19K102593
SAMPLER	Grace Sheckler
DATE	5/3/2022

SINGLE POINT CALIBRATION				
LOT NUMBER	182827722			
EXPIRATION DATE	06/03/2023			
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	4.02	4	yes	08:29
pH	7.15	7	yes	08:33
pH	10.11	10	yes	08:37
Conductivity	1.478	1.413	yes	08:23
DO	103	99.9	yes	08:41

¹ CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:


5/3/2022
 SIGNED DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	USACE NE Devens TO Y3 8a JV
PROJECT NUMBER	30130800
MODEL	["YSI ProDSS"]
SERIAL NUMBER	19K102593
SAMPLER	Grace Sheckler
DATE	5/4/2022

SINGLE POINT CALIBRATION				
LOT NUMBER	21250049			
EXPIRATION DATE	07/12/2022			
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	3.96	4	yes	07:45
pH	7.09	7	yes	07:48
pH	9.83	10	yes	07:51
Conductivity	1.408	1.413	yes	07:52
DO	99.6	100	yes	07:57

¹ CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:


5/4/2022
 SIGNED DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	USACE NE Devens TO Y3 8a JV
PROJECT NUMBER	30130800
MODEL	["YSI ProDSS"]
SERIAL NUMBER	19J103221
SAMPLER	Diane Champagne
DATE	5/4/2022

TURBIDITY CALIBRATION			
CALIBRATION READING			
LOT NUMBER			
EXPIRATION DATE			
PRE-CALIBRATION	POST-CALIBRATION	TURBIDITY CALIBRATION WITHIN RANGE	TIME
0.19	0.01	yes	08:01

SINGLE POINT CALIBRATION				
LOT NUMBER				
EXPIRATION DATE				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.07	7	yes	08:01
pH	10.59	10.01	yes	07:53
Conductivity	1.491	1.413	yes	07:44
ORP	229.5	240.1	yes	07:51
DO	99.8	99.8	yes	07:37

¹ CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:


SIGNED

5/4/2022
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	USACE NE Devens TO Y3 8a JV
PROJECT NUMBER	30130800
MODEL	["YSI ProDSS"]
SERIAL NUMBER	19K102593
SAMPLER	Grace Sheckler
DATE	5/5/2022

SINGLE POINT CALIBRATION				
LOT NUMBER	21250049			
EXPIRATION DATE	07/12/2022			
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	3.91	4	yes	07:52
pH	7.02	7	yes	07:56
pH	9.84	10	yes	08:00
Conductivity	1.501	1.413	yes	08:05
DO	99.9	100	yes	08:14

¹ CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

Grace Sheckler
SIGNED

5/5/2022
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	USACE NE Devens TO Y3 8a JV
PROJECT NUMBER	30130800
MODEL	["YSI ProDSS"]
SERIAL NUMBER	19J103221
SAMPLER	Diane Champagne
DATE	5/5/2022

SINGLE POINT CALIBRATION				
LOT NUMBER				
EXPIRATION DATE				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7	7	yes	08:25
pH	4.12	4.02	yes	08:25
Conductivity	1.116	1.413	yes	08:16
ORP	236.2	240.1	yes	08:01
DO	99.1	99.1	yes	08:08
Turbidity	0.55	0	yes	08:20

¹ CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:


SIGNED

5/5/2022
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	USACE NE Devens TO Y3 8a JV
PROJECT NUMBER	30130800
MODEL	YSI ProDSS
SERIAL NUMBER	21C100564
SAMPLER	Diane Champagne
DATE	10/27/2022

SINGLE POINT CALIBRATION				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.25	7.05	yes	08:21
pH	9.72	9.98	yes	08:26
pH	3.81	4.01	yes	08:22
Conductivity	0.974	1.412	yes	08:35
ORP	225.6	240.4	yes	08:38
DO	97.7	98.8	yes	08:29
Turbidity	14.04	10.03	yes	08:44

¹ CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:


10/27/2022
 SIGNED DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	USACE NE Devens TO Y3 8a JV
PROJECT NUMBER	30130800
MODEL	YSI Pro Plus
SERIAL NUMBER	19k102593
SAMPLER	Spencer Gust
DATE	10/27/2022

SINGLE POINT CALIBRATION				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	6.52	7	no	08:21
pH	9.52	10	no	08:24
pH	3.55	4	no	08:28
Conductivity	1.421	1.413	yes	08:12
ORP	254.4	234	yes	08:18
DO	98.8	99	yes	08:32
Turbidity	0.5	0	--	08:33
Turbidity	12	10	--	08:33

¹ CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:


10/27/2022
 SIGNED DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	USACE NE Devens TO Y3 8a JV
PROJECT NUMBER	30130800
MODEL	YSI ProDSS
SERIAL NUMBER	18G101313
SAMPLER	Grace Sheckler
DATE	10/27/2022

SINGLE POINT CALIBRATION				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	4	4	yes	08:25
pH	7.05	7	yes	08:29
pH	9.92	10	yes	08:31
Conductivity	1.384	1.413	yes	08:17
ORP	239.4	241.2	yes	08:23
DO	96.8	99	yes	08:12

¹ CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:


 SIGNED

10/27/2022

 DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	USACE NE Devens TO Y3 8a JV
PROJECT NUMBER	30130800
MODEL	YSI ProDSS
SERIAL NUMBER	21C100564
SAMPLER	Diane Champagne
DATE	10/31/2022

SINGLE POINT CALIBRATION				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.13	7.05	yes	07:53
pH	4.14	4.01	yes	07:54
pH	9.88	10.02	yes	07:59
Conductivity	1.496	1.413	yes	08:02
ORP	255.2	240.1	yes	07:47
DO	100	100.1	yes	08:04
Turbidity	17.14	10	yes	08:08

¹ CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:


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10/31/2022
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	USACE NE Devens TO Y3 8a JV
PROJECT NUMBER	30130800
MODEL	YSI ProDSS
SERIAL NUMBER	18G101313
SAMPLER	Grace Sheckler
DATE	10/31/2022

SINGLE POINT CALIBRATION				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	3.98	4	yes	08:06
pH	7.03	7	yes	08:11
pH	9.93	10	yes	08:16
Conductivity	1.439	1.413	yes	08:22
ORP	244.8	243.5	yes	08:20
DO	100.3	99.5	yes	08:01

¹ CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:


10/31/2022
 SIGNED DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	USACE NE Devens TO Y3 8a JV
PROJECT NUMBER	30130800
MODEL	YSI Pro Plus
SERIAL NUMBER	19k102593
SAMPLER	Spencer Gust
DATE	10/31/2022

SINGLE POINT CALIBRATION				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.32	7	no	10:17
pH	10.2	10	yes	10:18
pH	4.5	4	no	10:20
Conductivity	1.457	1.413	--	10:13
ORP	234	234	yes	10:16
DO	98.4	99.8	yes	10:24
Turbidity	0.23	0	--	10:24
Turbidity	11.5	10	yes	10:27

¹ CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:


10/31/2022
 SIGNED DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	USACE NE Devens TO Y3 8a JV
PROJECT NUMBER	30130800
MODEL	YSI ProDSS
SERIAL NUMBER	21C100564
SAMPLER	Diane Champagne
DATE	11/01/2022

SINGLE POINT CALIBRATION				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	7.07	7.05	yes	07:45
pH	4.02	4.02	yes	07:41
pH	9.89	9.99	yes	07:50
Conductivity	1.444	1.413	yes	07:35
ORP	242.4	240.2	yes	07:52
DO	99.9	99.9	yes	07:49
Turbidity	8.5	10	yes	07:59

¹ CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:

Diane Champagne
SIGNED

11/1/2022
DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	USACE NE Devens TO Y3 8a JV
PROJECT NUMBER	30130800
MODEL	YSI ProDSS
SERIAL NUMBER	18G101313
SAMPLER	Grace Sheckler
DATE	11/01/2022

SINGLE POINT CALIBRATION				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	3.95	4	yes	07:36
pH	7.03	7	yes	07:39
pH	9.83	10	yes	07:43
Conductivity	1.535	1.413	yes	07:52
ORP	239	239.9	yes	07:47
DO	99.9	99.2	yes	07:58

¹ CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:


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11/1/2022
 DATE

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME	USACE NE Devens TO Y3 8a JV
PROJECT NUMBER	30130800
MODEL	YSI ProDSS
SERIAL NUMBER	19k102593
SAMPLER	Spencer Gust
DATE	11/01/2022

SINGLE POINT CALIBRATION				
PARAMETERS	PRE-CALIBRATION	POST-CALIBRATION	SINGLE POINT CALIBRATION WITHIN RANGE	TIME
pH	6.66	7	no	08:22
pH	9.74	10	no	08:24
pH	3.76	4	no	08:30
Conductivity	1.627	1.413	--	08:15
ORP	235.5	234	yes	08:18
DO	99.1	99.2	yes	08:34
Turbidity	0.5	0	--	08:35
Turbidity	11.2	10	--	08:38

¹ CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE QUALITY METER

NOTES:


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11/1/2022
DATE

Appendix B

Laboratory Analytical Reports

ANALYTICAL REPORT

Eurofins Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-215075-1
Client Project/Site: Fort Devens AOC 57

For:
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Attn: Heather Levesque



Authorized for release by:
5/16/2022 5:23:57 PM

Jerry Lanier, Project Manager I
(912)250-0281
Jerry.Lanier@et.eurofinsus.com

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results through



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The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens AOC 57

Job ID: 680-215075-1

Qualifiers

Metals

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens AOC 57

Job ID: 680-215075-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-215075-1	57-SW1-SPR22	Water	05/04/22 10:15	05/06/22 10:40
680-215075-2	57M-95-03X-SPR22	Water	05/04/22 12:01	05/06/22 10:40
680-215075-3	57M-96-11X-SPR22	Water	05/04/22 13:16	05/06/22 10:40
680-215075-4	AOC57-DUP01-SPR22	Water	05/04/22 13:20	05/06/22 10:40

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12

Case Narrative

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens AOC 57

Job ID: 680-215075-1

1

2

Job ID: 680-215075-1

3

Laboratory: Eurofins Savannah

4

Narrative

**Job Narrative
680-215075-1**

5

Comments

No additional comments.

6

Receipt

The samples were received on 5/6/2022 10:40 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.6° C.

7

8

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

9

10

11

12

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens AOC 57

Job ID: 680-215075-1

Client Sample ID: 57-SW1-SPR22

Lab Sample ID: 680-215075-1

Date Collected: 05/04/22 10:15

Matrix: Water

Date Received: 05/06/22 10:40

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	1900		100	50	20	ug/L		05/14/22 23:08	1
Manganese	640		10	5.0	1.3	ug/L		05/14/22 23:08	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	1.3	J	5.0	3.0	0.86	ug/L		05/10/22 17:39	1



Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens AOC 57

Job ID: 680-215075-1

Client Sample ID: 57M-95-03X-SPR22

Lab Sample ID: 680-215075-2

Date Collected: 05/04/22 12:01

Matrix: Water

Date Received: 05/06/22 10:40

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	3100		100	50	20	ug/L		05/10/22 21:54	1
Manganese	140		10	5.0	1.3	ug/L		05/10/22 21:54	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	26		5.0	3.0	0.86	ug/L		05/10/22 15:30	1



Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens AOC 57

Job ID: 680-215075-1

Client Sample ID: 57M-96-11X-SPR22

Lab Sample ID: 680-215075-3

Date Collected: 05/04/22 13:16

Matrix: Water

Date Received: 05/06/22 10:40

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	43000		100	50	20	ug/L		05/10/22 22:15	1
Manganese	3100		10	5.0	1.3	ug/L		05/10/22 22:15	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	280		5.0	3.0	0.86	ug/L		05/10/22 16:06	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens AOC 57

Job ID: 680-215075-1

Client Sample ID: AOC57-DUP01-SPR22

Lab Sample ID: 680-215075-4

Date Collected: 05/04/22 13:20

Matrix: Water

Date Received: 05/06/22 10:40

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	45000		100	50	20	ug/L		05/10/22 22:18	1
Manganese	3000		10	5.0	1.3	ug/L		05/10/22 22:18	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	290		5.0	3.0	0.86	ug/L		05/10/22 16:09	1

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens AOC 57

Job ID: 680-215075-1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-719923/1-A
Matrix: Water
Analysis Batch: 720250

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 719923

Analyte	MB MB		LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Iron	50	U	100	50	20	ug/L		05/10/22 21:49	1
Manganese	5.0	U	10	5.0	1.3	ug/L		05/10/22 21:49	1

Lab Sample ID: LCS 680-719923/2-A
Matrix: Water
Analysis Batch: 720250

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 719923

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Iron	5000	4900		ug/L		98	87 - 115
Manganese	400	382		ug/L		95	90 - 114

Lab Sample ID: 680-215075-2 MS
Matrix: Water
Analysis Batch: 720250

Client Sample ID: 57M-95-03X-SPR22
Prep Type: Total/NA
Prep Batch: 719923

Analyte	Sample Sample		Spike Added	MS MS		Unit	D	%Rec	%Rec Limits
	Result	Qualifier		Result	Qualifier				
Iron	3100		5000	7980		ug/L		97	87 - 115
Manganese	140		400	512		ug/L		93	90 - 114

Lab Sample ID: 680-215075-2 MSD
Matrix: Water
Analysis Batch: 720250

Client Sample ID: 57M-95-03X-SPR22
Prep Type: Total/NA
Prep Batch: 719923

Analyte	Sample Sample		Spike Added	MSD MSD		Unit	D	%Rec	%Rec Limits	RPD	
	Result	Qualifier		Result	Qualifier					RPD	Limit
Iron	3100		5000	8240		ug/L		102	87 - 115	3	20
Manganese	140		400	516		ug/L		94	90 - 114	1	20

Lab Sample ID: MB 680-720064/1-A
Matrix: Water
Analysis Batch: 720882

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 720064

Analyte	MB MB		LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Iron	50	U	100	50	20	ug/L		05/14/22 22:12	1
Manganese	5.0	U	10	5.0	1.3	ug/L		05/14/22 22:12	1

Lab Sample ID: LCS 680-720064/2-A
Matrix: Water
Analysis Batch: 720882

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 720064

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Iron	5000	5000		ug/L		100	87 - 115
Manganese	400	402		ug/L		100	90 - 114

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens AOC 57

Job ID: 680-215075-1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 680-719924/1-A
Matrix: Water
Analysis Batch: 720193

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 719924

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		05/10/22 15:25	1

Lab Sample ID: LCS 680-719924/2-A
Matrix: Water
Analysis Batch: 720193

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 719924

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	98.8		ug/L		99	84 - 116

Lab Sample ID: 680-215075-2 MS
Matrix: Water
Analysis Batch: 720193

Client Sample ID: 57M-95-03X-SPR22
Prep Type: Total/NA
Prep Batch: 719924

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	26		100	130		ug/L		104	84 - 116

Lab Sample ID: 680-215075-2 MSD
Matrix: Water
Analysis Batch: 720193

Client Sample ID: 57M-95-03X-SPR22
Prep Type: Total/NA
Prep Batch: 719924

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	26		100	127		ug/L		101	84 - 116	2	20

Lab Sample ID: MB 680-720066/1-A
Matrix: Water
Analysis Batch: 720193

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 720066

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		05/10/22 16:48	1

Lab Sample ID: LCS 680-720066/2-A
Matrix: Water
Analysis Batch: 720193

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 720066

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	101		ug/L		101	84 - 116

QC Association Summary

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens AOC 57

Job ID: 680-215075-1

Metals

Prep Batch: 719923

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215075-2	57M-95-03X-SPR22	Total/NA	Water	3010A	
680-215075-3	57M-96-11X-SPR22	Total/NA	Water	3010A	
680-215075-4	AOC57-DUP01-SPR22	Total/NA	Water	3010A	
MB 680-719923/1-A	Method Blank	Total/NA	Water	3010A	
LCS 680-719923/2-A	Lab Control Sample	Total/NA	Water	3010A	
680-215075-2 MS	57M-95-03X-SPR22	Total/NA	Water	3010A	
680-215075-2 MSD	57M-95-03X-SPR22	Total/NA	Water	3010A	

Prep Batch: 719924

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215075-2	57M-95-03X-SPR22	Total/NA	Water	3010A	
680-215075-3	57M-96-11X-SPR22	Total/NA	Water	3010A	
680-215075-4	AOC57-DUP01-SPR22	Total/NA	Water	3010A	
MB 680-719924/1-A	Method Blank	Total/NA	Water	3010A	
LCS 680-719924/2-A	Lab Control Sample	Total/NA	Water	3010A	
680-215075-2 MS	57M-95-03X-SPR22	Total/NA	Water	3010A	
680-215075-2 MSD	57M-95-03X-SPR22	Total/NA	Water	3010A	

Prep Batch: 720064

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215075-1	57-SW1-SPR22	Dissolved	Water	3005A	
MB 680-720064/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-720064/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 720066

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215075-1	57-SW1-SPR22	Dissolved	Water	3005A	
MB 680-720066/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-720066/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 720193

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215075-1	57-SW1-SPR22	Dissolved	Water	6020A	720066
680-215075-2	57M-95-03X-SPR22	Total/NA	Water	6020A	719924
680-215075-3	57M-96-11X-SPR22	Total/NA	Water	6020A	719924
680-215075-4	AOC57-DUP01-SPR22	Total/NA	Water	6020A	719924
MB 680-719924/1-A	Method Blank	Total/NA	Water	6020A	719924
MB 680-720066/1-A	Method Blank	Total Recoverable	Water	6020A	720066
LCS 680-719924/2-A	Lab Control Sample	Total/NA	Water	6020A	719924
LCS 680-720066/2-A	Lab Control Sample	Total Recoverable	Water	6020A	720066
680-215075-2 MS	57M-95-03X-SPR22	Total/NA	Water	6020A	719924
680-215075-2 MSD	57M-95-03X-SPR22	Total/NA	Water	6020A	719924

Analysis Batch: 720250

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215075-2	57M-95-03X-SPR22	Total/NA	Water	6010C	719923
680-215075-3	57M-96-11X-SPR22	Total/NA	Water	6010C	719923
680-215075-4	AOC57-DUP01-SPR22	Total/NA	Water	6010C	719923
MB 680-719923/1-A	Method Blank	Total/NA	Water	6010C	719923
LCS 680-719923/2-A	Lab Control Sample	Total/NA	Water	6010C	719923
680-215075-2 MS	57M-95-03X-SPR22	Total/NA	Water	6010C	719923

Eurofins Savannah

QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens AOC 57

Job ID: 680-215075-1

Metals (Continued)

Analysis Batch: 720250 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215075-2 MSD	57M-95-03X-SPR22	Total/NA	Water	6010C	719923

Analysis Batch: 720882

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215075-1	57-SW1-SPR22	Dissolved	Water	6010C	720064
MB 680-720064/1-A	Method Blank	Total Recoverable	Water	6010C	720064
LCS 680-720064/2-A	Lab Control Sample	Total Recoverable	Water	6010C	720064



Lab Chronicle

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens AOC 57

Job ID: 680-215075-1

Client Sample ID: 57-SW1-SPR22

Lab Sample ID: 680-215075-1

Date Collected: 05/04/22 10:15

Matrix: Water

Date Received: 05/06/22 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	720064	05/10/22 10:22	JE	TAL SAV
Dissolved	Analysis	6010C		1			720882	05/14/22 23:08	BCB	TAL SAV
Instrument ID: ICPH										
Dissolved	Prep	3005A			50 mL	250 mL	720066	05/10/22 10:22	JE	TAL SAV
Dissolved	Analysis	6020A		1			720193	05/10/22 17:39	BWR	TAL SAV
Instrument ID: ICPMSD										

Client Sample ID: 57M-95-03X-SPR22

Lab Sample ID: 680-215075-2

Date Collected: 05/04/22 12:01

Matrix: Water

Date Received: 05/06/22 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	719923	05/09/22 16:31	JE	TAL SAV
Total/NA	Analysis	6010C		1			720250	05/10/22 21:54	BCB	TAL SAV
Instrument ID: ICPH										
Total/NA	Prep	3010A			50 mL	250 mL	719924	05/09/22 16:31	JE	TAL SAV
Total/NA	Analysis	6020A		1			720193	05/10/22 15:30	BWR	TAL SAV
Instrument ID: ICPMSD										

Client Sample ID: 57M-96-11X-SPR22

Lab Sample ID: 680-215075-3

Date Collected: 05/04/22 13:16

Matrix: Water

Date Received: 05/06/22 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	719923	05/09/22 16:31	JE	TAL SAV
Total/NA	Analysis	6010C		1			720250	05/10/22 22:15	BCB	TAL SAV
Instrument ID: ICPH										
Total/NA	Prep	3010A			50 mL	250 mL	719924	05/09/22 16:31	JE	TAL SAV
Total/NA	Analysis	6020A		1			720193	05/10/22 16:06	BWR	TAL SAV
Instrument ID: ICPMSD										

Client Sample ID: AOC57-DUP01-SPR22

Lab Sample ID: 680-215075-4

Date Collected: 05/04/22 13:20

Matrix: Water

Date Received: 05/06/22 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	719923	05/09/22 16:31	JE	TAL SAV
Total/NA	Analysis	6010C		1			720250	05/10/22 22:18	BCB	TAL SAV
Instrument ID: ICPH										
Total/NA	Prep	3010A			50 mL	250 mL	719924	05/09/22 16:31	JE	TAL SAV
Total/NA	Analysis	6020A		1			720193	05/10/22 16:09	BWR	TAL SAV
Instrument ID: ICPMSD										

Laboratory References:

TAL SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens AOC 57

Job ID: 680-215075-1

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	09-18-22

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Method Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens AOC 57

Job ID: 680-215075-1

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL SAV
6020A	Metals (ICP/MS)	SW846	TAL SAV
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL SAV
3010A	Preparation, Total Metals	SW846	TAL SAV

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858



CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Heather Levesque
669 Marina Drive, Suite B7, Charleston, SC 29492
(619) 370-0374, halevesque@seres-es.com

Boston # AOC57_SPR22
#215

Project Name: Former Fort Devens, Long Term Monitoring
Project Number: 30130800
WBS Code:

Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA
POC: Jerry Lanier, (912) 250-0281, jerry.lanier@et.eurofinsus.com
Ship to: Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404

Event: Seres-Arcadis JV, Long Term Monitoring, AOC 57, Spring 2022

Comments:
SW6010C/F/D/LT (B) = Fe Mn
SW6020A/F/D/LT (B) = As

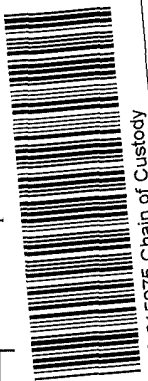
Equipment:

Code Matrix

WG	Ground Water
WS	Surface Water

Code | **Container/Preservative**

9	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC
---	---



680-215075 Chain of Custody

Sample ID	Matrix	Date	Time	Samp Init.	Analytical Test Method	SW6010C - Fe Mn	SW6010C/F/D/LT (B)	SW6020A - As	SW6020A/F/D/LT (B)	Location ID	Sample Type	Depth (ft bgs)		Cooler	Comments
												Top	Bottom		
1	WS	5-4-22	1015	SG		X			X	57-SW1	N1	0.00	0.00	1	
2	WG	5-4-22	1201	SG		X	X		X	57M-95-03X	MS1	7.00	17.00	1	
3	WG	5-4-22	1201	SG		X	X		X	57M-95-03X	N1	7.00	17.00	1	
4	WG	5-4-22	1201	SG		X	X		X	57M-95-03X	SD1	7.00	17.00	1	
5	WG	5-4-22	1316	SG		X	X		X	57M-96-11X	N1	2.00	12.00	1	
6	WG	5-4-22	1320	SG		X	X		X	57M-96-11X	FD1	2.00	12.00	1	
7															
8															
9															

Turnaround Time: Standard

Handwritten: 5/16 5:2-4:46

Handwritten: Relinquished by: June Shub
Date: 5/4/22
Time: 4:45

Handwritten: 5/16 5:22 1200

Handwritten: Received by: Path 5/4/22 1645
Date
Time

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Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-215075-1

Login Number: 215075

List Number: 1

Creator: Watters, David

List Source: Eurofins Savannah

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ANALYTICAL REPORT

Eurofins Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-214975-1
Client Project/Site: AOC 32/43A

For:

Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Attn: Heather Levesque



Authorized for release by:
6/2/2022 5:31:03 PM

Jerry Lanier, Project Manager I
(912)250-0281
Jerry.Lanier@et.eurofinsus.com

LINKS

Review your project
results through



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www.eurofinsus.com/Env

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: AOC 32/43A

Job ID: 680-214975-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

Metals

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: AOC 32/43A

Job ID: 680-214975-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-214975-1	32M-01-13XBR-SPR22	Water	05/03/22 14:45	05/05/22 10:40
680-214975-2	32M-01-14XOB-SPR22	Water	05/03/22 12:15	05/05/22 10:40
680-214975-3	32M-01-17XBR-SPR22	Water	05/03/22 16:20	05/05/22 10:40
680-214975-4	32M-01-18XBR-SPR22	Water	05/03/22 12:55	05/05/22 10:40
680-214975-5	AOC32-DUP01-SPR22	Water	05/03/22 12:55	05/05/22 10:40

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Case Narrative

Client: Seres Engineering & Services LLC
Project/Site: AOC 32/43A

Job ID: 680-214975-1

Job ID: 680-214975-1

Laboratory: Eurofins Savannah

Narrative

Job Narrative 680-214975-1

Comments

No additional comments.

Receipt

The samples were received on 5/5/2022 10:40 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.7° C.

GC/MS VOA

Method 8260B: Surrogate recovery for the following samples were outside the upper control limit: 32M-01-13XBR-SPR22 (680-214975-1) and (MB 680-720836/9). This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Method 8260B: The continuing calibration verification (CCV) associated with batch 680-720836 recovered above the upper control limit for Chloroethane, Bromomethane. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated sample is impacted: (CCVIS 680-720836/3).

Method 8260B: The closing continuing calibration verification (CCVC) analyzed in batch 720929 was outside the method criteria for the 12 hour window by 13 minutes. The data integrity was not impacted and the data has been reported and addressed. All other QC criteria have been met.

Method 8260B: The continuing calibration verification (CCV) analyzed in batch 680-721049 was outside the method criteria for the following analyte(s): 2,2-Dichloropropane, Chloromethane and Vinyl acetate. Chloromethane and Vinyl acetate has been identified as a poor performing analyte when analyzed using this method; therefore, re-extraction/re-analysis was not performed. An LCS spiked at the reporting limit was analyzed with the batch with passing recoveries showing adequate sensitivity at the reporting limit had the analytes been present. The samples were non-detect for the analytes. There is insufficient holding time to rerun the samples in hold. These results have been reported and qualified.

Method 8260B: The continuing calibration verification (CCV) associated with batch 680-721049 recovered above the upper control limit for 4-Methyl-2-pentanone. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method 8260B: The following sample was diluted due to color: (680-214932-A-5). Elevated reporting limits (RL) are provided.

Method 8260B: The following samples contained residual chlorine upon receipt: (680-214932-A-5), (680-214932-A-5 MS) and (680-214932-A-5 MSD).

Method 8260B: The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for analytical batch 680-721049 recovered outside control limits for the following analytes: Vinyl acetate.

Method 8260B: The matrix spike and/or The matrix spike duplicate ran outside of the 12 hour tune window. The recoveries were acceptable. The data has been qualified and reported.

32M-01-17XBR-SPR22 (680-214975-3[MS]) and 32M-01-17XBR-SPR22 (680-214975-3[MSD])

Method 8260B: The closing continuing calibration verification (CCVC) analyzed in batch 721049 was outside the method criteria for the 12 hour window. The data integrity was not impacted and the data has been reported and addressed. All other QC criteria have been met.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep

Case Narrative

Client: Seres Engineering & Services LLC
Project/Site: AOC 32/43A

Job ID: 680-214975-1

Job ID: 680-214975-1 (Continued)

Laboratory: Eurofins Savannah (Continued)

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Subcontract Work

Method MA VPH + BTEX: This method was subcontracted to Katahdin Analytical Services Inc. The subcontract laboratory certification is different from that of the facility issuing the final report.

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Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

Client Sample ID: 32M-01-13XBR-SPR22

Lab Sample ID: 680-214975-1

Date Collected: 05/03/22 14:45

Matrix: Water

Date Received: 05/05/22 10:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	1.0	U	2.0	1.0	0.36	ug/L		05/14/22 19:44	1
1,1,1-Trichloroethane	0.50	U	1.0	0.50	0.21	ug/L		05/14/22 19:44	1
1,1,2,2-Tetrachloroethane	1.0	U	2.0	1.0	0.40	ug/L		05/14/22 19:44	1
1,1,2-Trichloroethane	1.0	U	2.0	1.0	0.32	ug/L		05/14/22 19:44	1
1,1-Dichloroethane	1.0	U	2.0	1.0	0.33	ug/L		05/14/22 19:44	1
1,1-Dichloroethene	1.0	U	2.0	1.0	0.33	ug/L		05/14/22 19:44	1
1,1-Dichloropropene	1.0	U	2.0	1.0	0.28	ug/L		05/14/22 19:44	1
1,2,3-Trichlorobenzene	2.0	U	5.0	2.0	0.81	ug/L		05/14/22 19:44	1
1,2,3-Trichloropropane	1.0	U	2.0	1.0	0.48	ug/L		05/14/22 19:44	1
1,2,4-Trichlorobenzene	2.0	U	5.0	2.0	0.53	ug/L		05/14/22 19:44	1
1,2,4-Trimethylbenzene	1.0	U	2.0	1.0	0.43	ug/L		05/14/22 19:44	1
1,2-Dibromo-3-Chloropropane	5.0	U	10	5.0	1.8	ug/L		05/14/22 19:44	1
1,2-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		05/14/22 19:44	1
1,2-Dichloroethane	1.0	U M	2.0	1.0	0.25	ug/L		05/14/22 19:44	1
1,2-Dichloroethene, Total	1.0	U	2.0	1.0	0.37	ug/L		05/14/22 19:44	1
1,2-Dichloropropane	0.50	U	1.0	0.50	0.22	ug/L		05/14/22 19:44	1
1,3,5-Trimethylbenzene	1.0	U	2.0	1.0	0.28	ug/L		05/14/22 19:44	1
1,3-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		05/14/22 19:44	1
1,3-Dichloropropane	1.0	U	2.0	1.0	0.36	ug/L		05/14/22 19:44	1
1,4-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		05/14/22 19:44	1
2,2-Dichloropropane	1.0	U	2.0	1.0	0.35	ug/L		05/14/22 19:44	1
2-Butanone (MEK)	20	U	25	20	6.4	ug/L		05/14/22 19:44	1
2-Chlorotoluene	0.50	U	1.0	0.50	0.25	ug/L		05/14/22 19:44	1
2-Hexanone	10	U	20	10	3.2	ug/L		05/14/22 19:44	1
4-Chlorotoluene	1.0	U	2.0	1.0	0.41	ug/L		05/14/22 19:44	1
4-Isopropyltoluene	1.0	U	2.0	1.0	0.44	ug/L		05/14/22 19:44	1
4-Methyl-2-pentanone (MIBK)	10	U	20	10	2.7	ug/L		05/14/22 19:44	1
Acetone	10	U	25	10	3.7	ug/L		05/14/22 19:44	1
Benzene	1.0	U M	2.0	1.0	0.27	ug/L		05/14/22 19:44	1
Bromobenzene	0.50	U	1.0	0.50	0.24	ug/L		05/14/22 19:44	1
Bromoform	2.0	U	2.5	2.0	0.59	ug/L		05/14/22 19:44	1
Bromomethane	10	U Q	20	10	3.7	ug/L		05/14/22 19:44	1
Carbon disulfide	1.0	U	2.0	1.0	0.43	ug/L		05/14/22 19:44	1
Carbon tetrachloride	1.0	U	2.0	1.0	0.30	ug/L		05/14/22 19:44	1
Chlorobenzene	0.50	U	1.0	0.50	0.15	ug/L		05/14/22 19:44	1
Chlorobromomethane	1.0	U	2.0	1.0	0.34	ug/L		05/14/22 19:44	1
Chlorodibromomethane	1.0	U	2.0	1.0	0.39	ug/L		05/14/22 19:44	1
Chloroethane	10	U Q	20	10	4.6	ug/L		05/14/22 19:44	1
Chloroform	1.0	U	2.0	1.0	0.27	ug/L		05/14/22 19:44	1
Chloromethane	2.0	U	2.5	2.0	0.54	ug/L		05/14/22 19:44	1
cis-1,2-Dichloroethene	1.0	U	2.0	1.0	0.25	ug/L		05/14/22 19:44	1
cis-1,3-Dichloropropene	1.0	U	2.0	1.0	0.26	ug/L		05/14/22 19:44	1
Dibromomethane	1.0	U	2.0	1.0	0.34	ug/L		05/14/22 19:44	1
Dichlorobromomethane	1.0	U	2.0	1.0	0.25	ug/L		05/14/22 19:44	1
Dichlorodifluoromethane	1.0	U	2.0	1.0	0.36	ug/L		05/14/22 19:44	1
Ethylbenzene	0.50	U	1.0	0.50	0.20	ug/L		05/14/22 19:44	1
Ethylene Dibromide	1.0	U	2.0	1.0	0.33	ug/L		05/14/22 19:44	1
Hexachlorobutadiene	1.0	U	5.0	1.0	0.22	ug/L		05/14/22 19:44	1
Isopropylbenzene	1.0	U	2.0	1.0	0.26	ug/L		05/14/22 19:44	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

Client Sample ID: 32M-01-13XBR-SPR22

Lab Sample ID: 680-214975-1

Date Collected: 05/03/22 14:45

Matrix: Water

Date Received: 05/05/22 10:40

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Methyl tert-butyl ether	2.0	U	5.0	2.0	0.81	ug/L		05/14/22 19:44	1
Methylene Chloride	10	U	20	10	3.2	ug/L		05/14/22 19:44	1
m-Xylene & p-Xylene	1.0	U	2.0	1.0	0.49	ug/L		05/14/22 19:44	1
Naphthalene	5.0	U	10	5.0	2.4	ug/L		05/14/22 19:44	1
n-Butylbenzene	2.0	U	2.5	2.0	0.52	ug/L		05/14/22 19:44	1
N-Propylbenzene	1.0	U	2.0	1.0	0.41	ug/L		05/14/22 19:44	1
o-Xylene	1.0	U	2.0	1.0	0.26	ug/L		05/14/22 19:44	1
sec-Butylbenzene	2.0	U	2.5	2.0	0.53	ug/L		05/14/22 19:44	1
Styrene	1.0	U	2.0	1.0	0.27	ug/L		05/14/22 19:44	1
tert-Butylbenzene	1.0	U	2.0	1.0	0.43	ug/L		05/14/22 19:44	1
Tetrachloroethene	1.0	U	2.0	1.0	0.35	ug/L		05/14/22 19:44	1
Toluene	1.0	U	2.0	1.0	0.25	ug/L		05/14/22 19:44	1
trans-1,2-Dichloroethene	1.0	U	2.0	1.0	0.34	ug/L		05/14/22 19:44	1
trans-1,3-Dichloropropene	1.0	U	2.0	1.0	0.23	ug/L		05/14/22 19:44	1
Trichloroethene	0.50	U	1.0	0.50	0.20	ug/L		05/14/22 19:44	1
Trichlorofluoromethane	1.0	U	2.0	1.0	0.33	ug/L		05/14/22 19:44	1
Vinyl acetate	2.0	U Q	2.5	2.0	0.69	ug/L		05/14/22 19:44	1
Vinyl chloride	1.0	U	2.0	1.0	0.40	ug/L		05/14/22 19:44	1
Xylenes, Total	1.0	U	2.0	1.0	0.49	ug/L		05/14/22 19:44	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	94		85 - 114		05/14/22 19:44	1
Dibromofluoromethane (Surr)	129	Q	80 - 119		05/14/22 19:44	1
Toluene-d8 (Surr)	146	Q	89 - 112		05/14/22 19:44	1
1,2-Dichloroethane-d4 (Surr)	101		81 - 118		05/14/22 19:44	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Manganese	6.7	J	10	5.0	1.3	ug/L		05/09/22 18:18	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		05/09/22 17:20	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

Client Sample ID: 32M-01-14XOB-SPR22

Lab Sample ID: 680-214975-2

Date Collected: 05/03/22 12:15

Matrix: Water

Date Received: 05/05/22 10:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	1.0	U	2.0	1.0	0.36	ug/L		05/17/22 05:02	1
1,1,1-Trichloroethane	0.50	U	1.0	0.50	0.21	ug/L		05/17/22 05:02	1
1,1,2,2-Tetrachloroethane	1.0	U	2.0	1.0	0.40	ug/L		05/17/22 05:02	1
1,1,2-Trichloroethane	1.0	U	2.0	1.0	0.32	ug/L		05/17/22 05:02	1
1,1-Dichloroethane	1.0	U	2.0	1.0	0.33	ug/L		05/17/22 05:02	1
1,1-Dichloroethene	1.0	U	2.0	1.0	0.33	ug/L		05/17/22 05:02	1
1,1-Dichloropropene	1.0	U	2.0	1.0	0.28	ug/L		05/17/22 05:02	1
1,2,3-Trichlorobenzene	2.0	U	5.0	2.0	0.81	ug/L		05/17/22 05:02	1
1,2,3-Trichloropropane	1.0	U	2.0	1.0	0.48	ug/L		05/17/22 05:02	1
1,2,4-Trichlorobenzene	2.0	U	5.0	2.0	0.53	ug/L		05/17/22 05:02	1
1,2,4-Trimethylbenzene	1.0	U	2.0	1.0	0.43	ug/L		05/17/22 05:02	1
1,2-Dibromo-3-Chloropropane	5.0	U	10	5.0	1.8	ug/L		05/17/22 05:02	1
1,2-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		05/17/22 05:02	1
1,2-Dichloroethane	1.0	U M	2.0	1.0	0.25	ug/L		05/17/22 05:02	1
1,2-Dichloroethene, Total	1.0	U	2.0	1.0	0.37	ug/L		05/17/22 05:02	1
1,2-Dichloropropane	0.50	U	1.0	0.50	0.22	ug/L		05/17/22 05:02	1
1,3,5-Trimethylbenzene	1.0	U	2.0	1.0	0.28	ug/L		05/17/22 05:02	1
1,3-Dichlorobenzene	0.43	J	2.0	1.0	0.31	ug/L		05/17/22 05:02	1
1,3-Dichloropropane	1.0	U	2.0	1.0	0.36	ug/L		05/17/22 05:02	1
1,4-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		05/17/22 05:02	1
2,2-Dichloropropane	1.0	U Q	2.0	1.0	0.35	ug/L		05/17/22 05:02	1
2-Butanone (MEK)	20	U	25	20	6.4	ug/L		05/17/22 05:02	1
2-Chlorotoluene	0.50	U	1.0	0.50	0.25	ug/L		05/17/22 05:02	1
2-Hexanone	10	U	20	10	3.2	ug/L		05/17/22 05:02	1
4-Chlorotoluene	1.0	U	2.0	1.0	0.41	ug/L		05/17/22 05:02	1
4-Isopropyltoluene	1.0	U	2.0	1.0	0.44	ug/L		05/17/22 05:02	1
4-Methyl-2-pentanone (MIBK)	10	U Q	20	10	2.7	ug/L		05/17/22 05:02	1
Acetone	10	U	25	10	3.7	ug/L		05/17/22 05:02	1
Benzene	1.0	U	2.0	1.0	0.27	ug/L		05/17/22 05:02	1
Bromobenzene	0.50	U	1.0	0.50	0.24	ug/L		05/17/22 05:02	1
Bromoform	2.0	U	2.5	2.0	0.59	ug/L		05/17/22 05:02	1
Bromomethane	10	U	20	10	3.7	ug/L		05/17/22 05:02	1
Carbon disulfide	1.0	U	2.0	1.0	0.43	ug/L		05/17/22 05:02	1
Carbon tetrachloride	1.0	U	2.0	1.0	0.30	ug/L		05/17/22 05:02	1
Chlorobenzene	0.50	U	1.0	0.50	0.15	ug/L		05/17/22 05:02	1
Chlorobromomethane	1.0	U	2.0	1.0	0.34	ug/L		05/17/22 05:02	1
Chlorodibromomethane	1.0	U	2.0	1.0	0.39	ug/L		05/17/22 05:02	1
Chloroethane	10	U	20	10	4.6	ug/L		05/17/22 05:02	1
Chloroform	1.0	U	2.0	1.0	0.27	ug/L		05/17/22 05:02	1
Chloromethane	2.0	U Q	2.5	2.0	0.54	ug/L		05/17/22 05:02	1
cis-1,2-Dichloroethene	1.0	U	2.0	1.0	0.25	ug/L		05/17/22 05:02	1
cis-1,3-Dichloropropene	1.0	U	2.0	1.0	0.26	ug/L		05/17/22 05:02	1
Dibromomethane	1.0	U	2.0	1.0	0.34	ug/L		05/17/22 05:02	1
Dichlorobromomethane	1.0	U	2.0	1.0	0.25	ug/L		05/17/22 05:02	1
Dichlorodifluoromethane	1.0	U	2.0	1.0	0.36	ug/L		05/17/22 05:02	1
Ethylbenzene	0.50	U	1.0	0.50	0.20	ug/L		05/17/22 05:02	1
Ethylene Dibromide	1.0	U	2.0	1.0	0.33	ug/L		05/17/22 05:02	1
Hexachlorobutadiene	1.0	U	5.0	1.0	0.22	ug/L		05/17/22 05:02	1
Isopropylbenzene	1.0	U	2.0	1.0	0.26	ug/L		05/17/22 05:02	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

Client Sample ID: 32M-01-14XOB-SPR22

Lab Sample ID: 680-214975-2

Date Collected: 05/03/22 12:15

Matrix: Water

Date Received: 05/05/22 10:40

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Methyl tert-butyl ether	2.0	U	5.0	2.0	0.81	ug/L		05/17/22 05:02	1
Methylene Chloride	10	U	20	10	3.2	ug/L		05/17/22 05:02	1
m-Xylene & p-Xylene	1.0	U	2.0	1.0	0.49	ug/L		05/17/22 05:02	1
Naphthalene	5.0	U	10	5.0	2.4	ug/L		05/17/22 05:02	1
n-Butylbenzene	2.0	U	2.5	2.0	0.52	ug/L		05/17/22 05:02	1
N-Propylbenzene	1.0	U	2.0	1.0	0.41	ug/L		05/17/22 05:02	1
o-Xylene	1.0	U	2.0	1.0	0.26	ug/L		05/17/22 05:02	1
sec-Butylbenzene	2.0	U	2.5	2.0	0.53	ug/L		05/17/22 05:02	1
Styrene	1.0	U	2.0	1.0	0.27	ug/L		05/17/22 05:02	1
tert-Butylbenzene	1.0	U	2.0	1.0	0.43	ug/L		05/17/22 05:02	1
Tetrachloroethene	1.0	U	2.0	1.0	0.35	ug/L		05/17/22 05:02	1
Toluene	1.0	U	2.0	1.0	0.25	ug/L		05/17/22 05:02	1
trans-1,2-Dichloroethene	1.0	U	2.0	1.0	0.34	ug/L		05/17/22 05:02	1
trans-1,3-Dichloropropene	1.0	U	2.0	1.0	0.23	ug/L		05/17/22 05:02	1
Trichloroethene	0.50	U	1.0	0.50	0.20	ug/L		05/17/22 05:02	1
Trichlorofluoromethane	1.0	U	2.0	1.0	0.33	ug/L		05/17/22 05:02	1
Vinyl acetate	2.0	U Q	2.5	2.0	0.69	ug/L		05/17/22 05:02	1
Vinyl chloride	1.0	U	2.0	1.0	0.40	ug/L		05/17/22 05:02	1
Xylenes, Total	1.0	U	2.0	1.0	0.49	ug/L		05/17/22 05:02	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	98		85 - 114		05/17/22 05:02	1
Dibromofluoromethane (Surr)	105		80 - 119		05/17/22 05:02	1
Toluene-d8 (Surr)	101		89 - 112		05/17/22 05:02	1
1,2-Dichloroethane-d4 (Surr)	98		81 - 118		05/17/22 05:02	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Manganese	770		10	5.0	1.3	ug/L		05/09/22 18:27	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	29		5.0	3.0	0.86	ug/L		05/09/22 17:22	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

Client Sample ID: 32M-01-17XBR-SPR22

Lab Sample ID: 680-214975-3

Date Collected: 05/03/22 16:20

Matrix: Water

Date Received: 05/05/22 10:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	1.0	U	2.0	1.0	0.36	ug/L		05/17/22 10:52	1
1,1,1-Trichloroethane	0.50	U	1.0	0.50	0.21	ug/L		05/17/22 10:52	1
1,1,2,2-Tetrachloroethane	1.0	U	2.0	1.0	0.40	ug/L		05/17/22 10:52	1
1,1,2-Trichloroethane	1.0	U	2.0	1.0	0.32	ug/L		05/17/22 10:52	1
1,1-Dichloroethane	1.0	U	2.0	1.0	0.33	ug/L		05/17/22 10:52	1
1,1-Dichloroethene	1.0	U	2.0	1.0	0.33	ug/L		05/17/22 10:52	1
1,1-Dichloropropene	1.0	U	2.0	1.0	0.28	ug/L		05/17/22 10:52	1
1,2,3-Trichlorobenzene	2.0	U	5.0	2.0	0.81	ug/L		05/17/22 10:52	1
1,2,3-Trichloropropane	1.0	U	2.0	1.0	0.48	ug/L		05/17/22 10:52	1
1,2,4-Trichlorobenzene	2.0	U	5.0	2.0	0.53	ug/L		05/17/22 10:52	1
1,2,4-Trimethylbenzene	1.0	U	2.0	1.0	0.43	ug/L		05/17/22 10:52	1
1,2-Dibromo-3-Chloropropane	5.0	U	10	5.0	1.8	ug/L		05/17/22 10:52	1
1,2-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		05/17/22 10:52	1
1,2-Dichloroethane	1.0	U M	2.0	1.0	0.25	ug/L		05/17/22 10:52	1
1,2-Dichloroethene, Total	1.0	U	2.0	1.0	0.37	ug/L		05/17/22 10:52	1
1,2-Dichloropropane	0.50	U	1.0	0.50	0.22	ug/L		05/17/22 10:52	1
1,3,5-Trimethylbenzene	1.0	U	2.0	1.0	0.28	ug/L		05/17/22 10:52	1
1,3-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		05/17/22 10:52	1
1,3-Dichloropropane	1.0	U	2.0	1.0	0.36	ug/L		05/17/22 10:52	1
1,4-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		05/17/22 10:52	1
2,2-Dichloropropane	1.0	U Q J1	2.0	1.0	0.35	ug/L		05/17/22 10:52	1
2-Butanone (MEK)	20	U	25	20	6.4	ug/L		05/17/22 10:52	1
2-Chlorotoluene	0.50	U	1.0	0.50	0.25	ug/L		05/17/22 10:52	1
2-Hexanone	10	U	20	10	3.2	ug/L		05/17/22 10:52	1
4-Chlorotoluene	1.0	U	2.0	1.0	0.41	ug/L		05/17/22 10:52	1
4-Isopropyltoluene	1.0	U	2.0	1.0	0.44	ug/L		05/17/22 10:52	1
4-Methyl-2-pentanone (MIBK)	10	U Q	20	10	2.7	ug/L		05/17/22 10:52	1
Acetone	10	U	25	10	3.7	ug/L		05/17/22 10:52	1
Benzene	1.0	U	2.0	1.0	0.27	ug/L		05/17/22 10:52	1
Bromobenzene	0.50	U	1.0	0.50	0.24	ug/L		05/17/22 10:52	1
Bromoform	2.0	U	2.5	2.0	0.59	ug/L		05/17/22 10:52	1
Bromomethane	10	U	20	10	3.7	ug/L		05/17/22 10:52	1
Carbon disulfide	1.0	U	2.0	1.0	0.43	ug/L		05/17/22 10:52	1
Carbon tetrachloride	1.0	U	2.0	1.0	0.30	ug/L		05/17/22 10:52	1
Chlorobenzene	0.50	U	1.0	0.50	0.15	ug/L		05/17/22 10:52	1
Chlorobromomethane	1.0	U	2.0	1.0	0.34	ug/L		05/17/22 10:52	1
Chlorodibromomethane	1.0	U	2.0	1.0	0.39	ug/L		05/17/22 10:52	1
Chloroethane	10	U	20	10	4.6	ug/L		05/17/22 10:52	1
Chloroform	1.0	U	2.0	1.0	0.27	ug/L		05/17/22 10:52	1
Chloromethane	2.0	U Q	2.5	2.0	0.54	ug/L		05/17/22 10:52	1
cis-1,2-Dichloroethene	1.0	U	2.0	1.0	0.25	ug/L		05/17/22 10:52	1
cis-1,3-Dichloropropene	1.0	U	2.0	1.0	0.26	ug/L		05/17/22 10:52	1
Dibromomethane	1.0	U	2.0	1.0	0.34	ug/L		05/17/22 10:52	1
Dichlorobromomethane	1.0	U	2.0	1.0	0.25	ug/L		05/17/22 10:52	1
Dichlorodifluoromethane	1.0	U	2.0	1.0	0.36	ug/L		05/17/22 10:52	1
Ethylbenzene	0.50	U	1.0	0.50	0.20	ug/L		05/17/22 10:52	1
Ethylene Dibromide	1.0	U	2.0	1.0	0.33	ug/L		05/17/22 10:52	1
Hexachlorobutadiene	1.0	U	5.0	1.0	0.22	ug/L		05/17/22 10:52	1
Isopropylbenzene	1.0	U	2.0	1.0	0.26	ug/L		05/17/22 10:52	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

Client Sample ID: 32M-01-17XBR-SPR22

Lab Sample ID: 680-214975-3

Date Collected: 05/03/22 16:20

Matrix: Water

Date Received: 05/05/22 10:40

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Methyl tert-butyl ether	2.0	U	5.0	2.0	0.81	ug/L		05/17/22 10:52	1
Methylene Chloride	10	U	20	10	3.2	ug/L		05/17/22 10:52	1
m-Xylene & p-Xylene	1.0	U	2.0	1.0	0.49	ug/L		05/17/22 10:52	1
Naphthalene	5.0	U	10	5.0	2.4	ug/L		05/17/22 10:52	1
n-Butylbenzene	2.0	U	2.5	2.0	0.52	ug/L		05/17/22 10:52	1
N-Propylbenzene	1.0	U	2.0	1.0	0.41	ug/L		05/17/22 10:52	1
o-Xylene	1.0	U	2.0	1.0	0.26	ug/L		05/17/22 10:52	1
sec-Butylbenzene	2.0	U	2.5	2.0	0.53	ug/L		05/17/22 10:52	1
Styrene	1.0	U	2.0	1.0	0.27	ug/L		05/17/22 10:52	1
tert-Butylbenzene	1.0	U	2.0	1.0	0.43	ug/L		05/17/22 10:52	1
Tetrachloroethene	1.0	U	2.0	1.0	0.35	ug/L		05/17/22 10:52	1
Toluene	1.0	U	2.0	1.0	0.25	ug/L		05/17/22 10:52	1
trans-1,2-Dichloroethene	1.0	U	2.0	1.0	0.34	ug/L		05/17/22 10:52	1
trans-1,3-Dichloropropene	1.0	U	2.0	1.0	0.23	ug/L		05/17/22 10:52	1
Trichloroethene	0.50	U	1.0	0.50	0.20	ug/L		05/17/22 10:52	1
Trichlorofluoromethane	1.0	U	2.0	1.0	0.33	ug/L		05/17/22 10:52	1
Vinyl acetate	2.0	U Q	2.5	2.0	0.69	ug/L		05/17/22 10:52	1
Vinyl chloride	1.0	U	2.0	1.0	0.40	ug/L		05/17/22 10:52	1
Xylenes, Total	1.0	U	2.0	1.0	0.49	ug/L		05/17/22 10:52	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	95		85 - 114		05/17/22 10:52	1
Dibromofluoromethane (Surr)	103		80 - 119		05/17/22 10:52	1
Toluene-d8 (Surr)	101		89 - 112		05/17/22 10:52	1
1,2-Dichloroethane-d4 (Surr)	94		81 - 118		05/17/22 10:52	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Manganese	39		10	5.0	1.3	ug/L		05/09/22 13:13	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	1.3	J	5.0	3.0	0.86	ug/L		05/09/22 16:54	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

Client Sample ID: 32M-01-18XBR-SPR22

Lab Sample ID: 680-214975-4

Date Collected: 05/03/22 12:55

Matrix: Water

Date Received: 05/05/22 10:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	1.0	U	2.0	1.0	0.36	ug/L		05/17/22 05:25	1
1,1,1-Trichloroethane	0.50	U	1.0	0.50	0.21	ug/L		05/17/22 05:25	1
1,1,2,2-Tetrachloroethane	1.0	U	2.0	1.0	0.40	ug/L		05/17/22 05:25	1
1,1,2-Trichloroethane	1.0	U	2.0	1.0	0.32	ug/L		05/17/22 05:25	1
1,1-Dichloroethane	1.0	U	2.0	1.0	0.33	ug/L		05/17/22 05:25	1
1,1-Dichloroethene	1.0	U	2.0	1.0	0.33	ug/L		05/17/22 05:25	1
1,1-Dichloropropene	1.0	U	2.0	1.0	0.28	ug/L		05/17/22 05:25	1
1,2,3-Trichlorobenzene	2.0	U	5.0	2.0	0.81	ug/L		05/17/22 05:25	1
1,2,3-Trichloropropane	1.0	U	2.0	1.0	0.48	ug/L		05/17/22 05:25	1
1,2,4-Trichlorobenzene	2.0	U	5.0	2.0	0.53	ug/L		05/17/22 05:25	1
1,2,4-Trimethylbenzene	1.0	U	2.0	1.0	0.43	ug/L		05/17/22 05:25	1
1,2-Dibromo-3-Chloropropane	5.0	U	10	5.0	1.8	ug/L		05/17/22 05:25	1
1,2-Dichlorobenzene	160		2.0	1.0	0.31	ug/L		05/17/22 05:25	1
1,2-Dichloroethane	1.0	U M	2.0	1.0	0.25	ug/L		05/17/22 05:25	1
1,2-Dichloroethene, Total	1.0	U	2.0	1.0	0.37	ug/L		05/17/22 05:25	1
1,2-Dichloropropane	0.50	U	1.0	0.50	0.22	ug/L		05/17/22 05:25	1
1,3,5-Trimethylbenzene	1.0	U	2.0	1.0	0.28	ug/L		05/17/22 05:25	1
1,3-Dichlorobenzene	27		2.0	1.0	0.31	ug/L		05/17/22 05:25	1
1,3-Dichloropropane	1.0	U	2.0	1.0	0.36	ug/L		05/17/22 05:25	1
1,4-Dichlorobenzene	18		2.0	1.0	0.31	ug/L		05/17/22 05:25	1
2,2-Dichloropropane	1.0	U Q	2.0	1.0	0.35	ug/L		05/17/22 05:25	1
2-Butanone (MEK)	20	U	25	20	6.4	ug/L		05/17/22 05:25	1
2-Chlorotoluene	0.50	U	1.0	0.50	0.25	ug/L		05/17/22 05:25	1
2-Hexanone	10	U	20	10	3.2	ug/L		05/17/22 05:25	1
4-Chlorotoluene	1.0	U	2.0	1.0	0.41	ug/L		05/17/22 05:25	1
4-Isopropyltoluene	1.0	U	2.0	1.0	0.44	ug/L		05/17/22 05:25	1
4-Methyl-2-pentanone (MIBK)	10	U Q	20	10	2.7	ug/L		05/17/22 05:25	1
Acetone	10	U	25	10	3.7	ug/L		05/17/22 05:25	1
Benzene	0.28	J	2.0	1.0	0.27	ug/L		05/17/22 05:25	1
Bromobenzene	0.50	U	1.0	0.50	0.24	ug/L		05/17/22 05:25	1
Bromoform	2.0	U	2.5	2.0	0.59	ug/L		05/17/22 05:25	1
Bromomethane	10	U	20	10	3.7	ug/L		05/17/22 05:25	1
Carbon disulfide	1.0	U	2.0	1.0	0.43	ug/L		05/17/22 05:25	1
Carbon tetrachloride	1.0	U	2.0	1.0	0.30	ug/L		05/17/22 05:25	1
Chlorobenzene	160		1.0	0.50	0.15	ug/L		05/17/22 05:25	1
Chlorobromomethane	1.0	U	2.0	1.0	0.34	ug/L		05/17/22 05:25	1
Chlorodibromomethane	1.0	U	2.0	1.0	0.39	ug/L		05/17/22 05:25	1
Chloroethane	10	U	20	10	4.6	ug/L		05/17/22 05:25	1
Chloroform	1.0	U	2.0	1.0	0.27	ug/L		05/17/22 05:25	1
Chloromethane	2.0	U Q	2.5	2.0	0.54	ug/L		05/17/22 05:25	1
cis-1,2-Dichloroethene	1.0	U	2.0	1.0	0.25	ug/L		05/17/22 05:25	1
cis-1,3-Dichloropropene	1.0	U	2.0	1.0	0.26	ug/L		05/17/22 05:25	1
Dibromomethane	1.0	U	2.0	1.0	0.34	ug/L		05/17/22 05:25	1
Dichlorobromomethane	1.0	U	2.0	1.0	0.25	ug/L		05/17/22 05:25	1
Dichlorodifluoromethane	1.0	U	2.0	1.0	0.36	ug/L		05/17/22 05:25	1
Ethylbenzene	0.50	U	1.0	0.50	0.20	ug/L		05/17/22 05:25	1
Ethylene Dibromide	1.0	U	2.0	1.0	0.33	ug/L		05/17/22 05:25	1
Hexachlorobutadiene	1.0	U	5.0	1.0	0.22	ug/L		05/17/22 05:25	1
Isopropylbenzene	1.0	U	2.0	1.0	0.26	ug/L		05/17/22 05:25	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

Client Sample ID: 32M-01-18XBR-SPR22

Lab Sample ID: 680-214975-4

Date Collected: 05/03/22 12:55

Matrix: Water

Date Received: 05/05/22 10:40

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Methyl tert-butyl ether	2.0	U	5.0	2.0	0.81	ug/L		05/17/22 05:25	1
Methylene Chloride	10	U	20	10	3.2	ug/L		05/17/22 05:25	1
m-Xylene & p-Xylene	1.0	U	2.0	1.0	0.49	ug/L		05/17/22 05:25	1
Naphthalene	5.0	U	10	5.0	2.4	ug/L		05/17/22 05:25	1
n-Butylbenzene	2.0	U	2.5	2.0	0.52	ug/L		05/17/22 05:25	1
N-Propylbenzene	1.0	U	2.0	1.0	0.41	ug/L		05/17/22 05:25	1
o-Xylene	1.0	U	2.0	1.0	0.26	ug/L		05/17/22 05:25	1
sec-Butylbenzene	2.0	U	2.5	2.0	0.53	ug/L		05/17/22 05:25	1
Styrene	1.0	U	2.0	1.0	0.27	ug/L		05/17/22 05:25	1
tert-Butylbenzene	1.0	U	2.0	1.0	0.43	ug/L		05/17/22 05:25	1
Tetrachloroethene	1.0	U	2.0	1.0	0.35	ug/L		05/17/22 05:25	1
Toluene	1.0	U	2.0	1.0	0.25	ug/L		05/17/22 05:25	1
trans-1,2-Dichloroethene	1.0	U	2.0	1.0	0.34	ug/L		05/17/22 05:25	1
trans-1,3-Dichloropropene	1.0	U	2.0	1.0	0.23	ug/L		05/17/22 05:25	1
Trichloroethene	0.50	U	1.0	0.50	0.20	ug/L		05/17/22 05:25	1
Trichlorofluoromethane	1.0	U	2.0	1.0	0.33	ug/L		05/17/22 05:25	1
Vinyl acetate	2.0	U Q	2.5	2.0	0.69	ug/L		05/17/22 05:25	1
Vinyl chloride	1.0	U	2.0	1.0	0.40	ug/L		05/17/22 05:25	1
Xylenes, Total	1.0	U	2.0	1.0	0.49	ug/L		05/17/22 05:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	96		85 - 114		05/17/22 05:25	1
Dibromofluoromethane (Surr)	106		80 - 119		05/17/22 05:25	1
Toluene-d8 (Surr)	105		89 - 112		05/17/22 05:25	1
1,2-Dichloroethane-d4 (Surr)	99		81 - 118		05/17/22 05:25	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Manganese	1700		10	5.0	1.3	ug/L		05/09/22 18:30	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	2.3	J	5.0	3.0	0.86	ug/L		05/09/22 17:25	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

Client Sample ID: AOC32-DUP01-SPR22

Lab Sample ID: 680-214975-5

Date Collected: 05/03/22 12:55

Matrix: Water

Date Received: 05/05/22 10:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	1.0	U	2.0	1.0	0.36	ug/L		05/17/22 05:49	1
1,1,1-Trichloroethane	0.50	U	1.0	0.50	0.21	ug/L		05/17/22 05:49	1
1,1,2,2-Tetrachloroethane	1.0	U	2.0	1.0	0.40	ug/L		05/17/22 05:49	1
1,1,2-Trichloroethane	1.0	U	2.0	1.0	0.32	ug/L		05/17/22 05:49	1
1,1-Dichloroethane	1.0	U	2.0	1.0	0.33	ug/L		05/17/22 05:49	1
1,1-Dichloroethene	1.0	U	2.0	1.0	0.33	ug/L		05/17/22 05:49	1
1,1-Dichloropropene	1.0	U	2.0	1.0	0.28	ug/L		05/17/22 05:49	1
1,2,3-Trichlorobenzene	2.0	U	5.0	2.0	0.81	ug/L		05/17/22 05:49	1
1,2,3-Trichloropropane	1.0	U	2.0	1.0	0.48	ug/L		05/17/22 05:49	1
1,2,4-Trichlorobenzene	2.0	U	5.0	2.0	0.53	ug/L		05/17/22 05:49	1
1,2,4-Trimethylbenzene	1.0	U	2.0	1.0	0.43	ug/L		05/17/22 05:49	1
1,2-Dibromo-3-Chloropropane	5.0	U	10	5.0	1.8	ug/L		05/17/22 05:49	1
1,2-Dichlorobenzene	180		2.0	1.0	0.31	ug/L		05/17/22 05:49	1
1,2-Dichloroethane	1.0	U M	2.0	1.0	0.25	ug/L		05/17/22 05:49	1
1,2-Dichloroethene, Total	1.0	U	2.0	1.0	0.37	ug/L		05/17/22 05:49	1
1,2-Dichloropropane	0.50	U	1.0	0.50	0.22	ug/L		05/17/22 05:49	1
1,3,5-Trimethylbenzene	1.0	U	2.0	1.0	0.28	ug/L		05/17/22 05:49	1
1,3-Dichlorobenzene	31		2.0	1.0	0.31	ug/L		05/17/22 05:49	1
1,3-Dichloropropane	1.0	U	2.0	1.0	0.36	ug/L		05/17/22 05:49	1
1,4-Dichlorobenzene	22		2.0	1.0	0.31	ug/L		05/17/22 05:49	1
2,2-Dichloropropane	1.0	U Q	2.0	1.0	0.35	ug/L		05/17/22 05:49	1
2-Butanone (MEK)	20	U	25	20	6.4	ug/L		05/17/22 05:49	1
2-Chlorotoluene	0.50	U	1.0	0.50	0.25	ug/L		05/17/22 05:49	1
2-Hexanone	10	U	20	10	3.2	ug/L		05/17/22 05:49	1
4-Chlorotoluene	1.0	U	2.0	1.0	0.41	ug/L		05/17/22 05:49	1
4-Isopropyltoluene	1.0	U	2.0	1.0	0.44	ug/L		05/17/22 05:49	1
4-Methyl-2-pentanone (MIBK)	10	U Q	20	10	2.7	ug/L		05/17/22 05:49	1
Acetone	10	U	25	10	3.7	ug/L		05/17/22 05:49	1
Benzene	0.30	J	2.0	1.0	0.27	ug/L		05/17/22 05:49	1
Bromobenzene	0.50	U	1.0	0.50	0.24	ug/L		05/17/22 05:49	1
Bromoform	2.0	U	2.5	2.0	0.59	ug/L		05/17/22 05:49	1
Bromomethane	10	U	20	10	3.7	ug/L		05/17/22 05:49	1
Carbon disulfide	1.0	U	2.0	1.0	0.43	ug/L		05/17/22 05:49	1
Carbon tetrachloride	1.0	U	2.0	1.0	0.30	ug/L		05/17/22 05:49	1
Chlorobenzene	180		1.0	0.50	0.15	ug/L		05/17/22 05:49	1
Chlorobromomethane	1.0	U	2.0	1.0	0.34	ug/L		05/17/22 05:49	1
Chlorodibromomethane	1.0	U	2.0	1.0	0.39	ug/L		05/17/22 05:49	1
Chloroethane	10	U	20	10	4.6	ug/L		05/17/22 05:49	1
Chloroform	1.0	U	2.0	1.0	0.27	ug/L		05/17/22 05:49	1
Chloromethane	2.0	U Q	2.5	2.0	0.54	ug/L		05/17/22 05:49	1
cis-1,2-Dichloroethene	1.0	U	2.0	1.0	0.25	ug/L		05/17/22 05:49	1
cis-1,3-Dichloropropene	1.0	U	2.0	1.0	0.26	ug/L		05/17/22 05:49	1
Dibromomethane	1.0	U	2.0	1.0	0.34	ug/L		05/17/22 05:49	1
Dichlorobromomethane	1.0	U	2.0	1.0	0.25	ug/L		05/17/22 05:49	1
Dichlorodifluoromethane	1.0	U	2.0	1.0	0.36	ug/L		05/17/22 05:49	1
Ethylbenzene	0.50	U	1.0	0.50	0.20	ug/L		05/17/22 05:49	1
Ethylene Dibromide	1.0	U	2.0	1.0	0.33	ug/L		05/17/22 05:49	1
Hexachlorobutadiene	1.0	U	5.0	1.0	0.22	ug/L		05/17/22 05:49	1
Isopropylbenzene	1.0	U	2.0	1.0	0.26	ug/L		05/17/22 05:49	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

Client Sample ID: AOC32-DUP01-SPR22

Lab Sample ID: 680-214975-5

Date Collected: 05/03/22 12:55

Matrix: Water

Date Received: 05/05/22 10:40

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Methyl tert-butyl ether	2.0	U	5.0	2.0	0.81	ug/L		05/17/22 05:49	1
Methylene Chloride	10	U	20	10	3.2	ug/L		05/17/22 05:49	1
m-Xylene & p-Xylene	1.0	U	2.0	1.0	0.49	ug/L		05/17/22 05:49	1
Naphthalene	5.0	U	10	5.0	2.4	ug/L		05/17/22 05:49	1
n-Butylbenzene	2.0	U	2.5	2.0	0.52	ug/L		05/17/22 05:49	1
N-Propylbenzene	1.0	U	2.0	1.0	0.41	ug/L		05/17/22 05:49	1
o-Xylene	1.0	U	2.0	1.0	0.26	ug/L		05/17/22 05:49	1
sec-Butylbenzene	2.0	U	2.5	2.0	0.53	ug/L		05/17/22 05:49	1
Styrene	1.0	U	2.0	1.0	0.27	ug/L		05/17/22 05:49	1
tert-Butylbenzene	1.0	U	2.0	1.0	0.43	ug/L		05/17/22 05:49	1
Tetrachloroethene	1.0	U	2.0	1.0	0.35	ug/L		05/17/22 05:49	1
Toluene	1.0	U	2.0	1.0	0.25	ug/L		05/17/22 05:49	1
trans-1,2-Dichloroethene	1.0	U	2.0	1.0	0.34	ug/L		05/17/22 05:49	1
trans-1,3-Dichloropropene	1.0	U	2.0	1.0	0.23	ug/L		05/17/22 05:49	1
Trichloroethene	0.50	U	1.0	0.50	0.20	ug/L		05/17/22 05:49	1
Trichlorofluoromethane	1.0	U	2.0	1.0	0.33	ug/L		05/17/22 05:49	1
Vinyl acetate	2.0	U Q	2.5	2.0	0.69	ug/L		05/17/22 05:49	1
Vinyl chloride	1.0	U	2.0	1.0	0.40	ug/L		05/17/22 05:49	1
Xylenes, Total	1.0	U	2.0	1.0	0.49	ug/L		05/17/22 05:49	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	95		85 - 114		05/17/22 05:49	1
Dibromofluoromethane (Surr)	106		80 - 119		05/17/22 05:49	1
Toluene-d8 (Surr)	103		89 - 112		05/17/22 05:49	1
1,2-Dichloroethane-d4 (Surr)	99		81 - 118		05/17/22 05:49	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Manganese	1200		10	5.0	1.3	ug/L		05/09/22 18:33	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	2.1	J	5.0	3.0	0.86	ug/L		05/09/22 17:27	1

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-720836/9

Matrix: Water

Analysis Batch: 720836

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB	MB	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
1,1,1,2-Tetrachloroethane	1.0	U	2.0	1.0	0.36	ug/L		05/14/22 16:25	1
1,1,1-Trichloroethane	0.50	U	1.0	0.50	0.21	ug/L		05/14/22 16:25	1
1,1,2,2-Tetrachloroethane	1.0	U	2.0	1.0	0.40	ug/L		05/14/22 16:25	1
1,1,2-Trichloroethane	1.0	U	2.0	1.0	0.32	ug/L		05/14/22 16:25	1
1,1-Dichloroethane	1.0	U	2.0	1.0	0.33	ug/L		05/14/22 16:25	1
1,1-Dichloroethene	1.0	U	2.0	1.0	0.33	ug/L		05/14/22 16:25	1
1,1-Dichloropropene	1.0	U	2.0	1.0	0.28	ug/L		05/14/22 16:25	1
1,2,3-Trichlorobenzene	2.0	U	5.0	2.0	0.81	ug/L		05/14/22 16:25	1
1,2,3-Trichloropropane	1.0	U	2.0	1.0	0.48	ug/L		05/14/22 16:25	1
1,2,4-Trichlorobenzene	2.0	U	5.0	2.0	0.53	ug/L		05/14/22 16:25	1
1,2,4-Trimethylbenzene	1.0	U	2.0	1.0	0.43	ug/L		05/14/22 16:25	1
1,2-Dibromo-3-Chloropropane	5.0	U	10	5.0	1.8	ug/L		05/14/22 16:25	1
1,2-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		05/14/22 16:25	1
1,2-Dichloroethane	1.0	U M	2.0	1.0	0.25	ug/L		05/14/22 16:25	1
1,2-Dichloroethene, Total	1.0	U	2.0	1.0	0.37	ug/L		05/14/22 16:25	1
1,2-Dichloropropane	0.50	U	1.0	0.50	0.22	ug/L		05/14/22 16:25	1
1,3,5-Trimethylbenzene	1.0	U	2.0	1.0	0.28	ug/L		05/14/22 16:25	1
1,3-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		05/14/22 16:25	1
1,3-Dichloropropane	1.0	U	2.0	1.0	0.36	ug/L		05/14/22 16:25	1
1,4-Dichlorobenzene	1.0	U M	2.0	1.0	0.31	ug/L		05/14/22 16:25	1
2,2-Dichloropropane	1.0	U	2.0	1.0	0.35	ug/L		05/14/22 16:25	1
2-Butanone (MEK)	20	U	25	20	6.4	ug/L		05/14/22 16:25	1
2-Chlorotoluene	0.50	U M	1.0	0.50	0.25	ug/L		05/14/22 16:25	1
2-Hexanone	10	U	20	10	3.2	ug/L		05/14/22 16:25	1
4-Chlorotoluene	1.0	U	2.0	1.0	0.41	ug/L		05/14/22 16:25	1
4-Isopropyltoluene	1.0	U	2.0	1.0	0.44	ug/L		05/14/22 16:25	1
4-Methyl-2-pentanone (MIBK)	10	U	20	10	2.7	ug/L		05/14/22 16:25	1
Acetone	10	U	25	10	3.7	ug/L		05/14/22 16:25	1
Benzene	1.0	U M	2.0	1.0	0.27	ug/L		05/14/22 16:25	1
Bromobenzene	0.50	U	1.0	0.50	0.24	ug/L		05/14/22 16:25	1
Bromoform	2.0	U M	2.5	2.0	0.59	ug/L		05/14/22 16:25	1
Bromomethane	10	U	20	10	3.7	ug/L		05/14/22 16:25	1
Carbon disulfide	1.0	U	2.0	1.0	0.43	ug/L		05/14/22 16:25	1
Carbon tetrachloride	1.0	U	2.0	1.0	0.30	ug/L		05/14/22 16:25	1
Chlorobenzene	0.50	U	1.0	0.50	0.15	ug/L		05/14/22 16:25	1
Chlorobromomethane	1.0	U	2.0	1.0	0.34	ug/L		05/14/22 16:25	1
Chlorodibromomethane	1.0	U	2.0	1.0	0.39	ug/L		05/14/22 16:25	1
Chloroethane	10	U	20	10	4.6	ug/L		05/14/22 16:25	1
Chloroform	1.0	U	2.0	1.0	0.27	ug/L		05/14/22 16:25	1
Chloromethane	2.0	U	2.5	2.0	0.54	ug/L		05/14/22 16:25	1
cis-1,2-Dichloroethene	1.0	U	2.0	1.0	0.25	ug/L		05/14/22 16:25	1
cis-1,3-Dichloropropene	1.0	U	2.0	1.0	0.26	ug/L		05/14/22 16:25	1
Dibromomethane	1.0	U	2.0	1.0	0.34	ug/L		05/14/22 16:25	1
Dichlorobromomethane	1.0	U	2.0	1.0	0.25	ug/L		05/14/22 16:25	1
Dichlorodifluoromethane	1.0	U	2.0	1.0	0.36	ug/L		05/14/22 16:25	1
Ethylbenzene	0.50	U M	1.0	0.50	0.20	ug/L		05/14/22 16:25	1
Ethylene Dibromide	1.0	U	2.0	1.0	0.33	ug/L		05/14/22 16:25	1
Hexachlorobutadiene	1.0	U	5.0	1.0	0.22	ug/L		05/14/22 16:25	1

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-720836/9

Matrix: Water

Analysis Batch: 720836

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB	MB	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Isopropylbenzene	1.0	U	2.0	1.0	0.26	ug/L		05/14/22 16:25	1
Methyl tert-butyl ether	2.0	U	5.0	2.0	0.81	ug/L		05/14/22 16:25	1
Methylene Chloride	10	U	20	10	3.2	ug/L		05/14/22 16:25	1
m-Xylene & p-Xylene	1.0	U	2.0	1.0	0.49	ug/L		05/14/22 16:25	1
Naphthalene	5.0	U	10	5.0	2.4	ug/L		05/14/22 16:25	1
n-Butylbenzene	2.0	U	2.5	2.0	0.52	ug/L		05/14/22 16:25	1
N-Propylbenzene	1.0	U	2.0	1.0	0.41	ug/L		05/14/22 16:25	1
o-Xylene	1.0	U	2.0	1.0	0.26	ug/L		05/14/22 16:25	1
sec-Butylbenzene	2.0	U	2.5	2.0	0.53	ug/L		05/14/22 16:25	1
Styrene	1.0	U	2.0	1.0	0.27	ug/L		05/14/22 16:25	1
tert-Butylbenzene	1.0	U	2.0	1.0	0.43	ug/L		05/14/22 16:25	1
Tetrachloroethene	1.0	U	2.0	1.0	0.35	ug/L		05/14/22 16:25	1
Toluene	1.0	U	2.0	1.0	0.25	ug/L		05/14/22 16:25	1
trans-1,2-Dichloroethene	1.0	U	2.0	1.0	0.34	ug/L		05/14/22 16:25	1
trans-1,3-Dichloropropene	1.0	U	2.0	1.0	0.23	ug/L		05/14/22 16:25	1
Trichloroethene	0.50	U	1.0	0.50	0.20	ug/L		05/14/22 16:25	1
Trichlorofluoromethane	1.0	U	2.0	1.0	0.33	ug/L		05/14/22 16:25	1
Vinyl acetate	2.0	U	2.5	2.0	0.69	ug/L		05/14/22 16:25	1
Vinyl chloride	1.0	U	2.0	1.0	0.40	ug/L		05/14/22 16:25	1
Xylenes, Total	1.0	U	2.0	1.0	0.49	ug/L		05/14/22 16:25	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
4-Bromofluorobenzene (Surr)	95		85 - 114		05/14/22 16:25	1
Dibromofluoromethane (Surr)	126	Q	80 - 119		05/14/22 16:25	1
Toluene-d8 (Surr)	142	Q	89 - 112		05/14/22 16:25	1
1,2-Dichloroethane-d4 (Surr)	101		81 - 118		05/14/22 16:25	1

Lab Sample ID: LCS 680-720836/4

Matrix: Water

Analysis Batch: 720836

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,1,1-Trichloroethane	50.0	47.7		ug/L		95	74 - 131
1,1,2,2-Tetrachloroethane	50.0	49.6		ug/L		99	71 - 121
1,1,2-Trichloroethane	50.0	50.1		ug/L		100	80 - 119
1,1-Dichloroethane	50.0	49.8		ug/L		100	77 - 125
1,1-Dichloroethene	50.0	51.0		ug/L		102	71 - 131
1,1-Dichloropropene	50.0	49.4		ug/L		99	79 - 125
1,2,3-Trichlorobenzene	50.0	49.8		ug/L		100	69 - 129
1,2,3-Trichloropropane	50.0	47.5		ug/L		95	73 - 122
1,2,4-Trichlorobenzene	50.0	50.8		ug/L		102	69 - 130
1,2,4-Trimethylbenzene	50.0	53.8		ug/L		108	76 - 124
1,2-Dibromo-3-Chloropropane	50.0	40.8		ug/L		82	62 - 128
1,2-Dichlorobenzene	50.0	48.5		ug/L		97	80 - 119
1,2-Dichloroethane	50.0	48.1		ug/L		96	73 - 128
1,2-Dichloroethene, Total	100	98.7		ug/L		99	79 - 121
1,2-Dichloropropane	50.0	51.2		ug/L		102	78 - 122

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-720836/4

Matrix: Water

Analysis Batch: 720836

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,3,5-Trimethylbenzene	50.0	54.2		ug/L		108	75 - 124
1,3-Dichlorobenzene	50.0	49.3		ug/L		99	80 - 119
1,3-Dichloropropane	50.0	51.2		ug/L		102	80 - 119
1,4-Dichlorobenzene	50.0	49.7		ug/L		99	79 - 118
2,2-Dichloropropane	50.0	49.6		ug/L		99	60 - 139
2-Butanone (MEK)	250	205		ug/L		82	56 - 143
2-Chlorotoluene	50.0	53.6		ug/L		107	79 - 122
2-Hexanone	250	217		ug/L		87	57 - 139
4-Chlorotoluene	50.0	53.5		ug/L		107	78 - 122
4-Isopropyltoluene	50.0	48.7		ug/L		97	77 - 127
4-Methyl-2-pentanone (MIBK)	250	232		ug/L		93	67 - 130
Acetone	250	225		ug/L		90	39 - 160
Benzene	50.0	50.1		ug/L		100	79 - 120
Bromobenzene	50.0	54.0		ug/L		108	80 - 120
Bromoform	50.0	51.3		ug/L		103	66 - 130
Bromomethane	50.0	66.4		ug/L		133	53 - 141
Carbon disulfide	50.0	49.8		ug/L		100	64 - 133
Carbon tetrachloride	50.0	47.4		ug/L		95	72 - 136
Chlorobenzene	50.0	49.0		ug/L		98	82 - 118
Chlorobromomethane	50.0	51.5		ug/L		103	78 - 123
Chlorodibromomethane	50.0	49.1		ug/L		98	74 - 126
Chloroethane	50.0	60.8		ug/L		122	60 - 138
Chloroform	50.0	49.7		ug/L		99	79 - 124
Chloromethane	50.0	57.0		ug/L		114	50 - 139
cis-1,2-Dichloroethene	50.0	50.3		ug/L		101	78 - 123
cis-1,3-Dichloropropene	50.0	50.2		ug/L		100	75 - 124
Dibromomethane	50.0	48.2		ug/L		96	79 - 123
Dichlorobromomethane	50.0	48.5		ug/L		97	79 - 125
Dichlorodifluoromethane	50.0	47.2		ug/L		94	32 - 152
Ethylbenzene	50.0	52.5		ug/L		105	79 - 121
Ethylene Dibromide	50.0	50.0		ug/L		100	75 - 127
Hexachlorobutadiene	50.0	49.9		ug/L		100	66 - 134
Isopropylbenzene	50.0	52.7		ug/L		105	72 - 131
Methyl tert-butyl ether	50.0	46.3		ug/L		93	71 - 124
Methylene Chloride	50.0	51.8		ug/L		104	74 - 124
m-Xylene & p-Xylene	50.0	53.3		ug/L		107	80 - 121
Naphthalene	50.0	45.4		ug/L		91	61 - 128
n-Butylbenzene	50.0	48.3		ug/L		97	75 - 128
N-Propylbenzene	50.0	54.0		ug/L		108	76 - 126
o-Xylene	50.0	52.3		ug/L		105	78 - 122
sec-Butylbenzene	50.0	54.0		ug/L		108	77 - 126
Styrene	50.0	53.5		ug/L		107	78 - 123
tert-Butylbenzene	50.0	53.8		ug/L		108	78 - 124
Tetrachloroethene	50.0	52.3		ug/L		105	74 - 129
Toluene	50.0	50.6		ug/L		101	80 - 121
trans-1,2-Dichloroethene	50.0	48.5		ug/L		97	75 - 124
trans-1,3-Dichloropropene	50.0	51.3		ug/L		103	73 - 127
Trichloroethene	50.0	51.2		ug/L		102	79 - 123
Trichlorofluoromethane	50.0	50.5	J1	ug/L		101	65 - 141

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-720836/4

Matrix: Water

Analysis Batch: 720836

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Vinyl acetate	100	91.5		ug/L		92	54 - 146
Vinyl chloride	50.0	52.8		ug/L		106	58 - 137
Xylenes, Total	100	106		ug/L		106	79 - 121

Surrogate	LCS	LCS	Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	89		85 - 114
Dibromofluoromethane (Surr)	102		80 - 119
Toluene-d8 (Surr)	103		89 - 112
1,2-Dichloroethane-d4 (Surr)	95		81 - 118

Lab Sample ID: LCSD 680-720836/5

Matrix: Water

Analysis Batch: 720836

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD	LCSD	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
		Result	Qualifier						
1,1,1,2-Tetrachloroethane	50.0	53.6		ug/L		107	78 - 124	0	20
1,1,1,1-Trichloroethane	50.0	48.6		ug/L		97	74 - 131	2	20
1,1,2,2-Tetrachloroethane	50.0	49.4		ug/L		99	71 - 121	0	20
1,1,2-Trichloroethane	50.0	50.3		ug/L		101	80 - 119	0	20
1,1-Dichloroethane	50.0	51.2		ug/L		102	77 - 125	3	20
1,1-Dichloroethane	50.0	52.1		ug/L		104	71 - 131	2	20
1,1-Dichloropropene	50.0	49.3		ug/L		99	79 - 125	0	20
1,2,3-Trichlorobenzene	50.0	51.3		ug/L		103	69 - 129	3	20
1,2,3-Trichloropropane	50.0	47.3		ug/L		95	73 - 122	1	20
1,2,4-Trichlorobenzene	50.0	51.8		ug/L		104	69 - 130	2	20
1,2,4-Trimethylbenzene	50.0	54.9		ug/L		110	76 - 124	2	20
1,2-Dibromo-3-Chloropropane	50.0	42.0		ug/L		84	62 - 128	3	20
1,2-Dichlorobenzene	50.0	48.8		ug/L		98	80 - 119	1	20
1,2-Dichloroethane	50.0	48.8		ug/L		98	73 - 128	1	20
1,2-Dichloroethane, Total	100	101		ug/L		101	79 - 121	2	20
1,2-Dichloropropane	50.0	51.6		ug/L		103	78 - 122	1	20
1,3,5-Trimethylbenzene	50.0	54.4		ug/L		109	75 - 124	0	20
1,3-Dichlorobenzene	50.0	49.2		ug/L		98	80 - 119	0	20
1,3-Dichloropropane	50.0	51.4		ug/L		103	80 - 119	0	20
1,4-Dichlorobenzene	50.0	50.1		ug/L		100	79 - 118	1	20
2,2-Dichloropropane	50.0	49.4		ug/L		99	60 - 139	0	20
2-Butanone (MEK)	250	209		ug/L		84	56 - 143	2	20
2-Chlorotoluene	50.0	53.8		ug/L		108	79 - 122	0	20
2-Hexanone	250	222		ug/L		89	57 - 139	2	20
4-Chlorotoluene	50.0	53.7		ug/L		107	78 - 122	1	20
4-Isopropyltoluene	50.0	48.7		ug/L		97	77 - 127	0	20
4-Methyl-2-pentanone (MIBK)	250	234		ug/L		94	67 - 130	1	20
Acetone	250	232		ug/L		93	39 - 160	3	20
Benzene	50.0	50.2		ug/L		100	79 - 120	0	20
Bromobenzene	50.0	55.0		ug/L		110	80 - 120	2	20
Bromoform	50.0	51.1		ug/L		102	66 - 130	0	20
Bromomethane	50.0	67.9		ug/L		136	53 - 141	2	20
Carbon disulfide	50.0	51.3		ug/L		103	64 - 133	3	20

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QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: AOC 32/43A

Job ID: 680-214975-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-720836/5

Matrix: Water

Analysis Batch: 720836

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD	LCSD	Unit	D	%Rec	%Rec	RPD	RPD
		Result	Qualifier				Limits		Limit
Carbon tetrachloride	50.0	48.9		ug/L		98	72 - 136	3	20
Chlorobenzene	50.0	48.9		ug/L		98	82 - 118	0	20
Chlorobromomethane	50.0	52.5		ug/L		105	78 - 123	2	20
Chlorodibromomethane	50.0	50.0		ug/L		100	74 - 126	2	20
Chloroethane	50.0	62.4		ug/L		125	60 - 138	2	20
Chloroform	50.0	50.5		ug/L		101	79 - 124	2	20
Chloromethane	50.0	57.4		ug/L		115	50 - 139	1	20
cis-1,2-Dichloroethene	50.0	50.9		ug/L		102	78 - 123	1	20
cis-1,3-Dichloropropene	50.0	50.7		ug/L		101	75 - 124	1	20
Dibromomethane	50.0	49.3		ug/L		99	79 - 123	2	20
Dichlorobromomethane	50.0	48.9		ug/L		98	79 - 125	1	20
Dichlorodifluoromethane	50.0	48.2		ug/L		96	32 - 152	2	20
Ethylbenzene	50.0	52.7		ug/L		105	79 - 121	0	20
Ethylene Dibromide	50.0	50.7		ug/L		101	75 - 127	1	20
Hexachlorobutadiene	50.0	50.5		ug/L		101	66 - 134	1	20
Isopropylbenzene	50.0	52.8		ug/L		106	72 - 131	0	20
Methyl tert-butyl ether	50.0	46.1		ug/L		92	71 - 124	0	20
Methylene Chloride	50.0	53.2		ug/L		106	74 - 124	3	20
m-Xylene & p-Xylene	50.0	53.5		ug/L		107	80 - 121	0	20
Naphthalene	50.0	46.2		ug/L		92	61 - 128	2	20
n-Butylbenzene	50.0	49.2		ug/L		98	75 - 128	2	20
N-Propylbenzene	50.0	54.5		ug/L		109	76 - 126	1	20
o-Xylene	50.0	52.4		ug/L		105	78 - 122	0	20
sec-Butylbenzene	50.0	54.3		ug/L		109	77 - 126	1	20
Styrene	50.0	54.0		ug/L		108	78 - 123	1	20
tert-Butylbenzene	50.0	54.6		ug/L		109	78 - 124	1	20
Tetrachloroethene	50.0	52.0		ug/L		104	74 - 129	1	20
Toluene	50.0	50.7		ug/L		101	80 - 121	0	20
trans-1,2-Dichloroethene	50.0	49.8		ug/L		100	75 - 124	3	20
trans-1,3-Dichloropropene	50.0	51.3		ug/L		103	73 - 127	0	20
Trichloroethene	50.0	51.7		ug/L		103	79 - 123	1	20
Trichlorofluoromethane	50.0	51.5	J1	ug/L		103	65 - 141	2	20
Vinyl acetate	100	86.1		ug/L		86	54 - 146	6	20
Vinyl chloride	50.0	53.2		ug/L		106	58 - 137	1	20
Xylenes, Total	100	106		ug/L		106	79 - 121	0	20

Surrogate	LCSD	LCSD	Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	89		85 - 114
Dibromofluoromethane (Surr)	104		80 - 119
Toluene-d8 (Surr)	103		89 - 112
1,2-Dichloroethane-d4 (Surr)	97		81 - 118

Lab Sample ID: MB 680-721049/44

Matrix: Water

Analysis Batch: 721049

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB	MB	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
1,1,1,2-Tetrachloroethane	1.0	U	2.0	1.0	0.36	ug/L		05/17/22 02:42	1

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-721049/44

Client Sample ID: Method Blank

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 721049

Analyte	MB	MB	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
1,1,1-Trichloroethane	0.50	U	1.0	0.50	0.21	ug/L		05/17/22 02:42	1
1,1,1,2,2-Tetrachloroethane	1.0	U	2.0	1.0	0.40	ug/L		05/17/22 02:42	1
1,1,1,2-Trichloroethane	1.0	U	2.0	1.0	0.32	ug/L		05/17/22 02:42	1
1,1-Dichloroethane	1.0	U	2.0	1.0	0.33	ug/L		05/17/22 02:42	1
1,1-Dichloroethene	1.0	U	2.0	1.0	0.33	ug/L		05/17/22 02:42	1
1,1-Dichloropropene	1.0	U	2.0	1.0	0.28	ug/L		05/17/22 02:42	1
1,2,3-Trichlorobenzene	2.0	U	5.0	2.0	0.81	ug/L		05/17/22 02:42	1
1,2,3-Trichloropropane	1.0	U	2.0	1.0	0.48	ug/L		05/17/22 02:42	1
1,2,4-Trichlorobenzene	2.0	U	5.0	2.0	0.53	ug/L		05/17/22 02:42	1
1,2,4-Trimethylbenzene	1.0	U	2.0	1.0	0.43	ug/L		05/17/22 02:42	1
1,2-Dibromo-3-Chloropropane	5.0	U	10	5.0	1.8	ug/L		05/17/22 02:42	1
1,2-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		05/17/22 02:42	1
1,2-Dichloroethane	1.0	U M	2.0	1.0	0.25	ug/L		05/17/22 02:42	1
1,2-Dichloroethene, Total	1.0	U	2.0	1.0	0.37	ug/L		05/17/22 02:42	1
1,2-Dichloropropane	0.50	U	1.0	0.50	0.22	ug/L		05/17/22 02:42	1
1,3,5-Trimethylbenzene	1.0	U	2.0	1.0	0.28	ug/L		05/17/22 02:42	1
1,3-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		05/17/22 02:42	1
1,3-Dichloropropane	1.0	U	2.0	1.0	0.36	ug/L		05/17/22 02:42	1
1,4-Dichlorobenzene	1.0	U	2.0	1.0	0.31	ug/L		05/17/22 02:42	1
2,2-Dichloropropane	1.0	U	2.0	1.0	0.35	ug/L		05/17/22 02:42	1
2-Butanone (MEK)	20	U	25	20	6.4	ug/L		05/17/22 02:42	1
2-Chlorotoluene	0.50	U	1.0	0.50	0.25	ug/L		05/17/22 02:42	1
2-Hexanone	10	U	20	10	3.2	ug/L		05/17/22 02:42	1
4-Chlorotoluene	1.0	U	2.0	1.0	0.41	ug/L		05/17/22 02:42	1
4-Isopropyltoluene	1.0	U	2.0	1.0	0.44	ug/L		05/17/22 02:42	1
4-Methyl-2-pentanone (MIBK)	10	U	20	10	2.7	ug/L		05/17/22 02:42	1
Acetone	10	U	25	10	3.7	ug/L		05/17/22 02:42	1
Benzene	1.0	U	2.0	1.0	0.27	ug/L		05/17/22 02:42	1
Bromobenzene	0.50	U	1.0	0.50	0.24	ug/L		05/17/22 02:42	1
Bromoform	2.0	U	2.5	2.0	0.59	ug/L		05/17/22 02:42	1
Bromomethane	10	U	20	10	3.7	ug/L		05/17/22 02:42	1
Carbon disulfide	1.0	U	2.0	1.0	0.43	ug/L		05/17/22 02:42	1
Carbon tetrachloride	1.0	U	2.0	1.0	0.30	ug/L		05/17/22 02:42	1
Chlorobenzene	0.50	U	1.0	0.50	0.15	ug/L		05/17/22 02:42	1
Chlorobromomethane	1.0	U	2.0	1.0	0.34	ug/L		05/17/22 02:42	1
Chlorodibromomethane	1.0	U	2.0	1.0	0.39	ug/L		05/17/22 02:42	1
Chloroethane	10	U	20	10	4.6	ug/L		05/17/22 02:42	1
Chloroform	1.0	U	2.0	1.0	0.27	ug/L		05/17/22 02:42	1
Chloromethane	2.0	U	2.5	2.0	0.54	ug/L		05/17/22 02:42	1
cis-1,2-Dichloroethene	1.0	U	2.0	1.0	0.25	ug/L		05/17/22 02:42	1
cis-1,3-Dichloropropene	1.0	U	2.0	1.0	0.26	ug/L		05/17/22 02:42	1
Dibromomethane	1.0	U	2.0	1.0	0.34	ug/L		05/17/22 02:42	1
Dichlorobromomethane	1.0	U	2.0	1.0	0.25	ug/L		05/17/22 02:42	1
Dichlorodifluoromethane	1.0	U	2.0	1.0	0.36	ug/L		05/17/22 02:42	1
Ethylbenzene	0.50	U	1.0	0.50	0.20	ug/L		05/17/22 02:42	1
Ethylene Dibromide	1.0	U	2.0	1.0	0.33	ug/L		05/17/22 02:42	1
Hexachlorobutadiene	1.0	U	5.0	1.0	0.22	ug/L		05/17/22 02:42	1
Isopropylbenzene	1.0	U	2.0	1.0	0.26	ug/L		05/17/22 02:42	1
Methyl tert-butyl ether	2.0	U	5.0	2.0	0.81	ug/L		05/17/22 02:42	1

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QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: AOC 32/43A

Job ID: 680-214975-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-721049/44

Client Sample ID: Method Blank

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 721049

Analyte	MB MB		LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Methylene Chloride	10	U	20	10	3.2	ug/L		05/17/22 02:42	1
m-Xylene & p-Xylene	1.0	U	2.0	1.0	0.49	ug/L		05/17/22 02:42	1
Naphthalene	5.0	U	10	5.0	2.4	ug/L		05/17/22 02:42	1
n-Butylbenzene	2.0	U	2.5	2.0	0.52	ug/L		05/17/22 02:42	1
N-Propylbenzene	1.0	U	2.0	1.0	0.41	ug/L		05/17/22 02:42	1
o-Xylene	1.0	U	2.0	1.0	0.26	ug/L		05/17/22 02:42	1
sec-Butylbenzene	2.0	U	2.5	2.0	0.53	ug/L		05/17/22 02:42	1
Styrene	1.0	U	2.0	1.0	0.27	ug/L		05/17/22 02:42	1
tert-Butylbenzene	1.0	U	2.0	1.0	0.43	ug/L		05/17/22 02:42	1
Tetrachloroethene	1.0	U	2.0	1.0	0.35	ug/L		05/17/22 02:42	1
Toluene	1.0	U	2.0	1.0	0.25	ug/L		05/17/22 02:42	1
trans-1,2-Dichloroethene	1.0	U	2.0	1.0	0.34	ug/L		05/17/22 02:42	1
trans-1,3-Dichloropropene	1.0	U	2.0	1.0	0.23	ug/L		05/17/22 02:42	1
Trichloroethene	0.50	U	1.0	0.50	0.20	ug/L		05/17/22 02:42	1
Trichlorofluoromethane	1.0	U	2.0	1.0	0.33	ug/L		05/17/22 02:42	1
Vinyl acetate	2.0	U	2.5	2.0	0.69	ug/L		05/17/22 02:42	1
Vinyl chloride	1.0	U	2.0	1.0	0.40	ug/L		05/17/22 02:42	1
Xylenes, Total	1.0	U	2.0	1.0	0.49	ug/L		05/17/22 02:42	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
4-Bromofluorobenzene (Surr)	96		85 - 114		05/17/22 02:42	1
Dibromofluoromethane (Surr)	104		80 - 119		05/17/22 02:42	1
Toluene-d8 (Surr)	102		89 - 112		05/17/22 02:42	1
1,2-Dichloroethane-d4 (Surr)	93		81 - 118		05/17/22 02:42	1

Lab Sample ID: LCS 680-721049/39

Client Sample ID: Lab Control Sample

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 721049

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
1,1,1,2-Tetrachloroethane	50.0	55.3		ug/L		111	78 - 124
1,1,1-Trichloroethane	50.0	45.0		ug/L		90	74 - 131
1,1,2,2-Tetrachloroethane	50.0	50.6		ug/L		101	71 - 121
1,1,2-Trichloroethane	50.0	51.4		ug/L		103	80 - 119
1,1-Dichloroethane	50.0	48.6		ug/L		97	77 - 125
1,1-Dichloroethene	50.0	45.5		ug/L		91	71 - 131
1,1-Dichloropropene	50.0	47.6		ug/L		95	79 - 125
1,2,3-Trichlorobenzene	50.0	55.9		ug/L		112	69 - 129
1,2,3-Trichloropropane	50.0	57.8		ug/L		116	73 - 122
1,2,4-Trichlorobenzene	50.0	52.9		ug/L		106	69 - 130
1,2,4-Trimethylbenzene	50.0	48.1		ug/L		96	76 - 124
1,2-Dibromo-3-Chloropropane	50.0	54.4		ug/L		109	62 - 128
1,2-Dichlorobenzene	50.0	51.2		ug/L		102	80 - 119
1,2-Dichloroethane	50.0	47.6		ug/L		95	73 - 128
1,2-Dichloroethene, Total	100	94.3		ug/L		94	79 - 121
1,2-Dichloropropane	50.0	51.2		ug/L		102	78 - 122
1,3,5-Trimethylbenzene	50.0	47.7		ug/L		95	75 - 124
1,3-Dichlorobenzene	50.0	51.3		ug/L		103	80 - 119

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-721049/39

Matrix: Water

Analysis Batch: 721049

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,3-Dichloropropane	50.0	51.5		ug/L		103	80 - 119
1,4-Dichlorobenzene	50.0	49.2		ug/L		98	79 - 118
2,2-Dichloropropane	50.0	28.4	Q	ug/L		57	60 - 139
2-Butanone (MEK)	250	257		ug/L		103	56 - 143
2-Chlorotoluene	50.0	50.8		ug/L		102	79 - 122
2-Hexanone	250	291		ug/L		116	57 - 139
4-Chlorotoluene	50.0	50.6		ug/L		101	78 - 122
4-Isopropyltoluene	50.0	47.3		ug/L		95	77 - 127
4-Methyl-2-pentanone (MIBK)	250	295		ug/L		118	67 - 130
Acetone	250	276		ug/L		111	39 - 160
Benzene	50.0	50.0		ug/L		100	79 - 120
Bromobenzene	50.0	53.1		ug/L		106	80 - 120
Bromoform	50.0	57.0		ug/L		114	66 - 130
Bromomethane	50.0	54.8		ug/L		110	53 - 141
Carbon disulfide	50.0	46.5		ug/L		93	64 - 133
Carbon tetrachloride	50.0	43.7		ug/L		87	72 - 136
Chlorobenzene	50.0	50.0		ug/L		100	82 - 118
Chlorobromomethane	50.0	47.5		ug/L		95	78 - 123
Chlorodibromomethane	50.0	50.3		ug/L		101	74 - 126
Chloroethane	50.0	57.7		ug/L		115	60 - 138
Chloroform	50.0	47.4		ug/L		95	79 - 124
Chloromethane	50.0	40.9	M	ug/L		82	50 - 139
cis-1,2-Dichloroethene	50.0	46.9		ug/L		94	78 - 123
cis-1,3-Dichloropropene	50.0	47.7		ug/L		95	75 - 124
Dibromomethane	50.0	48.5		ug/L		97	79 - 123
Dichlorobromomethane	50.0	47.5		ug/L		95	79 - 125
Dichlorodifluoromethane	50.0	38.4		ug/L		77	32 - 152
Ethylbenzene	50.0	50.0		ug/L		100	79 - 121
Ethylene Dibromide	50.0	52.8		ug/L		106	75 - 127
Hexachlorobutadiene	50.0	47.5		ug/L		95	66 - 134
Isopropylbenzene	50.0	49.1		ug/L		98	72 - 131
Methyl tert-butyl ether	50.0	52.3		ug/L		105	71 - 124
Methylene Chloride	50.0	47.4		ug/L		95	74 - 124
m-Xylene & p-Xylene	50.0	49.5		ug/L		99	80 - 121
Naphthalene	50.0	56.6		ug/L		113	61 - 128
n-Butylbenzene	50.0	44.8		ug/L		90	75 - 128
N-Propylbenzene	50.0	48.8		ug/L		98	76 - 126
o-Xylene	50.0	49.6		ug/L		99	78 - 122
sec-Butylbenzene	50.0	47.6		ug/L		95	77 - 126
Styrene	50.0	51.1		ug/L		102	78 - 123
tert-Butylbenzene	50.0	48.4		ug/L		97	78 - 124
Tetrachloroethene	50.0	49.2		ug/L		98	74 - 129
Toluene	50.0	49.8		ug/L		100	80 - 121
trans-1,2-Dichloroethene	50.0	47.4		ug/L		95	75 - 124
trans-1,3-Dichloropropene	50.0	47.6		ug/L		95	73 - 127
Trichloroethene	50.0	56.5		ug/L		113	79 - 123
Trichlorofluoromethane	50.0	44.1		ug/L		88	65 - 141
Vinyl acetate	100	54.3		ug/L		54	54 - 146
Vinyl chloride	50.0	46.2		ug/L		92	58 - 137

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QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: AOC 32/43A

Job ID: 680-214975-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-721049/39

Matrix: Water

Analysis Batch: 721049

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Xylenes, Total	100	99.1		ug/L		99	79 - 121

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	93		85 - 114
Dibromofluoromethane (Surr)	98		80 - 119
Toluene-d8 (Surr)	100		89 - 112
1,2-Dichloroethane-d4 (Surr)	95		81 - 118

Lab Sample ID: LCSD 680-721049/40

Matrix: Water

Analysis Batch: 721049

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,1,1,2-Tetrachloroethane	50.0	54.8		ug/L		110	78 - 124	1	20
1,1,1-Trichloroethane	50.0	44.6		ug/L		89	74 - 131	1	20
1,1,2,2-Tetrachloroethane	50.0	54.2		ug/L		108	71 - 121	7	20
1,1,2-Trichloroethane	50.0	51.2		ug/L		102	80 - 119	0	20
1,1-Dichloroethane	50.0	48.4		ug/L		97	77 - 125	0	20
1,1-Dichloroethane	50.0	46.1		ug/L		92	71 - 131	1	20
1,1-Dichloropropene	50.0	48.1		ug/L		96	79 - 125	1	20
1,2,3-Trichlorobenzene	50.0	55.3		ug/L		111	69 - 129	1	20
1,2,3-Trichloropropane	50.0	58.7		ug/L		117	73 - 122	2	20
1,2,4-Trichlorobenzene	50.0	53.5		ug/L		107	69 - 130	1	20
1,2,4-Trimethylbenzene	50.0	48.7		ug/L		97	76 - 124	1	20
1,2-Dibromo-3-Chloropropane	50.0	53.7		ug/L		107	62 - 128	1	20
1,2-Dichlorobenzene	50.0	51.3		ug/L		103	80 - 119	0	20
1,2-Dichloroethane	50.0	47.9		ug/L		96	73 - 128	1	20
1,2-Dichloroethane, Total	100	93.5		ug/L		93	79 - 121	1	20
1,2-Dichloropropane	50.0	51.4		ug/L		103	78 - 122	0	20
1,3,5-Trimethylbenzene	50.0	48.6		ug/L		97	75 - 124	2	20
1,3-Dichlorobenzene	50.0	51.2		ug/L		102	80 - 119	0	20
1,3-Dichloropropane	50.0	53.1		ug/L		106	80 - 119	3	20
1,4-Dichlorobenzene	50.0	49.7		ug/L		99	79 - 118	1	20
2,2-Dichloropropane	50.0	27.7	Q	ug/L		55	60 - 139	3	20
2-Butanone (MEK)	250	261		ug/L		105	56 - 143	2	20
2-Chlorotoluene	50.0	50.1		ug/L		100	79 - 122	1	20
2-Hexanone	250	290		ug/L		116	57 - 139	0	20
4-Chlorotoluene	50.0	50.5		ug/L		101	78 - 122	0	20
4-Isopropyltoluene	50.0	48.1		ug/L		96	77 - 127	2	20
4-Methyl-2-pentanone (MIBK)	250	296		ug/L		118	67 - 130	0	20
Acetone	250	269		ug/L		108	39 - 160	3	20
Benzene	50.0	49.2		ug/L		98	79 - 120	2	20
Bromobenzene	50.0	52.6		ug/L		105	80 - 120	1	20
Bromoform	50.0	57.3		ug/L		115	66 - 130	0	20
Bromomethane	50.0	55.9		ug/L		112	53 - 141	2	20
Carbon disulfide	50.0	46.4		ug/L		93	64 - 133	0	20
Carbon tetrachloride	50.0	43.5		ug/L		87	72 - 136	0	20
Chlorobenzene	50.0	49.4		ug/L		99	82 - 118	1	20

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-721049/40

Matrix: Water

Analysis Batch: 721049

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chlorobromomethane	50.0	47.6		ug/L		95	78 - 123	0	20
Chlorodibromomethane	50.0	50.2		ug/L		100	74 - 126	0	20
Chloroethane	50.0	56.6		ug/L		113	60 - 138	2	20
Chloroform	50.0	47.6		ug/L		95	79 - 124	0	20
Chloromethane	50.0	40.4	M	ug/L		81	50 - 139	1	20
cis-1,2-Dichloroethene	50.0	46.6		ug/L		93	78 - 123	1	20
cis-1,3-Dichloropropene	50.0	47.5		ug/L		95	75 - 124	0	20
Dibromomethane	50.0	48.6		ug/L		97	79 - 123	0	20
Dichlorobromomethane	50.0	47.5		ug/L		95	79 - 125	0	20
Dichlorodifluoromethane	50.0	39.0		ug/L		78	32 - 152	1	20
Ethylbenzene	50.0	49.2		ug/L		98	79 - 121	2	20
Ethylene Dibromide	50.0	53.8		ug/L		108	75 - 127	2	20
Hexachlorobutadiene	50.0	47.2		ug/L		94	66 - 134	1	20
Isopropylbenzene	50.0	48.3		ug/L		97	72 - 131	2	20
Methyl tert-butyl ether	50.0	51.9		ug/L		104	71 - 124	1	20
Methylene Chloride	50.0	48.8		ug/L		98	74 - 124	3	20
m-Xylene & p-Xylene	50.0	48.9		ug/L		98	80 - 121	1	20
Naphthalene	50.0	56.8		ug/L		114	61 - 128	0	20
n-Butylbenzene	50.0	45.9		ug/L		92	75 - 128	2	20
N-Propylbenzene	50.0	49.5		ug/L		99	76 - 126	1	20
o-Xylene	50.0	49.9		ug/L		100	78 - 122	0	20
sec-Butylbenzene	50.0	48.1		ug/L		96	77 - 126	1	20
Styrene	50.0	50.9		ug/L		102	78 - 123	0	20
tert-Butylbenzene	50.0	48.5		ug/L		97	78 - 124	0	20
Tetrachloroethene	50.0	49.1		ug/L		98	74 - 129	0	20
Toluene	50.0	49.4		ug/L		99	80 - 121	1	20
trans-1,2-Dichloroethene	50.0	46.9		ug/L		94	75 - 124	1	20
trans-1,3-Dichloropropene	50.0	47.1		ug/L		94	73 - 127	1	20
Trichloroethene	50.0	53.4		ug/L		107	79 - 123	6	20
Trichlorofluoromethane	50.0	45.1		ug/L		90	65 - 141	2	20
Vinyl acetate	100	85.7	Q	ug/L		86	54 - 146	45	20
Vinyl chloride	50.0	45.8		ug/L		92	58 - 137	1	20
Xylenes, Total	100	98.8		ug/L		99	79 - 121	0	20

Surrogate	LCSD		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	95		85 - 114
Dibromofluoromethane (Surr)	99		80 - 119
Toluene-d8 (Surr)	100		89 - 112
1,2-Dichloroethane-d4 (Surr)	97		81 - 118

Lab Sample ID: 680-214975-3 MS

Matrix: Water

Analysis Batch: 721049

Client Sample ID: 32M-01-17XBR-SPR22

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
1,1,1,2-Tetrachloroethane	1.0	U	50.0	52.2		ug/L		104	78 - 124
1,1,1-Trichloroethane	0.50	U	50.0	46.7		ug/L		93	74 - 131
1,1,2,2-Tetrachloroethane	1.0	U	50.0	55.5		ug/L		111	71 - 121

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 680-214975-3 MS

Client Sample ID: 32M-01-17XBR-SPR22

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 721049

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec Limits
	Result	Qualifier	Added	Result	Qualifier				
1,1,2-Trichloroethane	1.0	U	50.0	48.2		ug/L		96	80 - 119
1,1-Dichloroethane	1.0	U	50.0	47.8		ug/L		96	77 - 125
1,1-Dichloroethene	1.0	U	50.0	48.4		ug/L		97	71 - 131
1,1-Dichloropropene	1.0	U	50.0	50.4		ug/L		101	79 - 125
1,2,3-Trichlorobenzene	2.0	U	50.0	55.4		ug/L		111	69 - 129
1,2,3-Trichloropropane	1.0	U	50.0	54.3		ug/L		109	73 - 122
1,2,4-Trichlorobenzene	2.0	U	50.0	52.4		ug/L		105	69 - 130
1,2,4-Trimethylbenzene	1.0	U	50.0	44.7		ug/L		89	76 - 124
1,2-Dibromo-3-Chloropropane	5.0	U	50.0	55.0		ug/L		110	62 - 128
1,2-Dichlorobenzene	1.0	U	50.0	51.3		ug/L		103	80 - 119
1,2-Dichloroethane	1.0	U M	50.0	46.5		ug/L		93	73 - 128
1,2-Dichloroethene, Total	1.0	U	100	93.9		ug/L		94	79 - 121
1,2-Dichloropropane	0.50	U	50.0	50.7		ug/L		101	78 - 122
1,3,5-Trimethylbenzene	1.0	U	50.0	45.2		ug/L		90	75 - 124
1,3-Dichlorobenzene	1.0	U	50.0	52.4		ug/L		105	80 - 119
1,3-Dichloropropane	1.0	U	50.0	50.2		ug/L		100	80 - 119
1,4-Dichlorobenzene	1.0	U	50.0	49.2		ug/L		98	79 - 118
2,2-Dichloropropane	1.0	U Q J1	50.0	20.0	J1	ug/L		40	60 - 139
2-Butanone (MEK)	20	U	250	237		ug/L		95	56 - 143
2-Chlorotoluene	0.50	U	50.0	46.8		ug/L		94	79 - 122
2-Hexanone	10	U	250	287		ug/L		115	57 - 139
4-Chlorotoluene	1.0	U	50.0	46.6		ug/L		93	78 - 122
4-Isopropyltoluene	1.0	U	50.0	49.1		ug/L		98	77 - 127
4-Methyl-2-pentanone (MIBK)	10	U Q	250	289		ug/L		116	67 - 130
Acetone	10	U	250	254		ug/L		102	39 - 160
Benzene	1.0	U	50.0	49.7		ug/L		99	79 - 120
Bromobenzene	0.50	U	50.0	51.1		ug/L		102	80 - 120
Bromoform	2.0	U	50.0	53.5		ug/L		107	66 - 130
Bromomethane	10	U	50.0	45.6		ug/L		91	53 - 141
Carbon disulfide	1.0	U	50.0	48.6		ug/L		97	64 - 133
Carbon tetrachloride	1.0	U	50.0	46.0		ug/L		92	72 - 136
Chlorobenzene	0.50	U	50.0	49.6		ug/L		99	82 - 118
Chlorobromomethane	1.0	U	50.0	48.7		ug/L		97	78 - 123
Chlorodibromomethane	1.0	U	50.0	48.4		ug/L		97	74 - 126
Chloroethane	10	U	50.0	63.2		ug/L		126	60 - 138
Chloroform	1.0	U	50.0	46.9		ug/L		94	79 - 124
Chloromethane	2.0	U Q	50.0	42.9	M	ug/L		86	50 - 139
cis-1,2-Dichloroethene	1.0	U	50.0	46.7		ug/L		93	78 - 123
cis-1,3-Dichloropropene	1.0	U	50.0	43.2		ug/L		86	75 - 124
Dibromomethane	1.0	U	50.0	47.2		ug/L		94	79 - 123
Dichlorobromomethane	1.0	U	50.0	45.9		ug/L		92	79 - 125
Dichlorodifluoromethane	1.0	U	50.0	48.8		ug/L		98	32 - 152
Ethylbenzene	0.50	U	50.0	49.8		ug/L		100	79 - 121
Ethylene Dibromide	1.0	U	50.0	51.5		ug/L		103	75 - 127
Hexachlorobutadiene	1.0	U	50.0	48.0		ug/L		96	66 - 134
Isopropylbenzene	1.0	U	50.0	47.6		ug/L		95	72 - 131
Methyl tert-butyl ether	2.0	U	50.0	49.3		ug/L		99	71 - 124
Methylene Chloride	10	U	50.0	47.5		ug/L		95	74 - 124
m-Xylene & p-Xylene	1.0	U	50.0	47.4		ug/L		95	80 - 121

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QC Sample Results

Client: Seres Engineering & Services LLC
Project/Site: AOC 32/43A

Job ID: 680-214975-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 680-214975-3 MS

Client Sample ID: 32M-01-17XBR-SPR22

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 721049

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec Limits
	Result	Qualifier	Added	Result	Qualifier				
Naphthalene	5.0	U	50.0	57.9		ug/L		116	61 - 128
n-Butylbenzene	2.0	U	50.0	46.4		ug/L		93	75 - 128
N-Propylbenzene	1.0	U	50.0	47.2		ug/L		94	76 - 126
o-Xylene	1.0	U	50.0	47.0		ug/L		94	78 - 122
sec-Butylbenzene	2.0	U	50.0	44.9		ug/L		90	77 - 126
Styrene	1.0	U	50.0	47.3		ug/L		95	78 - 123
tert-Butylbenzene	1.0	U	50.0	45.8		ug/L		92	78 - 124
Tetrachloroethene	1.0	U	50.0	50.1		ug/L		100	74 - 129
Toluene	1.0	U	50.0	50.6		ug/L		101	80 - 121
trans-1,2-Dichloroethene	1.0	U	50.0	47.2		ug/L		94	75 - 124
trans-1,3-Dichloropropene	1.0	U	50.0	43.3		ug/L		87	73 - 127
Trichloroethene	0.50	U	50.0	52.4		ug/L		105	79 - 123
Trichlorofluoromethane	1.0	U	50.0	52.1		ug/L		104	65 - 141
Vinyl acetate	2.0	U Q	100	79.8		ug/L		80	54 - 146
Vinyl chloride	1.0	U	50.0	52.3		ug/L		105	58 - 137
Xylenes, Total	1.0	U	100	94.4		ug/L		94	79 - 121

Surrogate	MS	MS	Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	98		85 - 114
Dibromofluoromethane (Surr)	99		80 - 119
Toluene-d8 (Surr)	102		89 - 112
1,2-Dichloroethane-d4 (Surr)	93		81 - 118

Lab Sample ID: 680-214975-3 MSD

Client Sample ID: 32M-01-17XBR-SPR22

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 721049

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec Limits	RPD	Limit
	Result	Qualifier	Added	Result	Qualifier						
1,1,1,2-Tetrachloroethane	1.0	U	50.0	50.6		ug/L		101	78 - 124	3	20
1,1,1-Trichloroethane	0.50	U	50.0	45.0		ug/L		90	74 - 131	4	20
1,1,2,2-Tetrachloroethane	1.0	U	50.0	53.4		ug/L		107	71 - 121	4	20
1,1,2-Trichloroethane	1.0	U	50.0	46.1		ug/L		92	80 - 119	4	20
1,1-Dichloroethane	1.0	U	50.0	46.4		ug/L		93	77 - 125	3	20
1,1-Dichloroethene	1.0	U	50.0	47.1		ug/L		94	71 - 131	3	20
1,1-Dichloropropene	1.0	U	50.0	48.3		ug/L		97	79 - 125	4	20
1,2,3-Trichlorobenzene	2.0	U	50.0	53.7		ug/L		107	69 - 129	3	20
1,2,3-Trichloropropane	1.0	U	50.0	52.9		ug/L		106	73 - 122	3	20
1,2,4-Trichlorobenzene	2.0	U	50.0	49.7		ug/L		99	69 - 130	5	20
1,2,4-Trimethylbenzene	1.0	U	50.0	43.4		ug/L		87	76 - 124	3	20
1,2-Dibromo-3-Chloropropane	5.0	U	50.0	53.5		ug/L		107	62 - 128	3	20
1,2-Dichlorobenzene	1.0	U	50.0	49.3		ug/L		99	80 - 119	4	20
1,2-Dichloroethane	1.0	U M	50.0	45.0		ug/L		90	73 - 128	3	20
1,2-Dichloroethene, Total	1.0	U	100	91.0		ug/L		91	79 - 121	3	20
1,2-Dichloropropane	0.50	U	50.0	48.0		ug/L		96	78 - 122	6	20
1,3,5-Trimethylbenzene	1.0	U	50.0	43.6		ug/L		87	75 - 124	4	20
1,3-Dichlorobenzene	1.0	U	50.0	49.5		ug/L		99	80 - 119	6	20
1,3-Dichloropropane	1.0	U	50.0	48.2		ug/L		96	80 - 119	4	20
1,4-Dichlorobenzene	1.0	U	50.0	47.8		ug/L		96	79 - 118	3	20

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 680-214975-3 MSD

Client Sample ID: 32M-01-17XBR-SPR22

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 721049

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec	RPD	RPD
	Result	Qualifier	Added	Result	Qualifier				Limits		Limit
2,2-Dichloropropane	1.0	U Q J1	50.0	18.6	J1	ug/L		37	60 - 139	7	20
2-Butanone (MEK)	20	U	250	229		ug/L		92	56 - 143	3	20
2-Chlorotoluene	0.50	U	50.0	45.2		ug/L		90	79 - 122	3	20
2-Hexanone	10	U	250	273		ug/L		109	57 - 139	5	20
4-Chlorotoluene	1.0	U	50.0	44.5		ug/L		89	78 - 122	5	20
4-Isopropyltoluene	1.0	U	50.0	46.9		ug/L		94	77 - 127	5	20
4-Methyl-2-pentanone (MIBK)	10	U Q	250	280		ug/L		112	67 - 130	3	20
Acetone	10	U	250	250		ug/L		100	39 - 160	2	20
Benzene	1.0	U	50.0	47.9		ug/L		96	79 - 120	4	20
Bromobenzene	0.50	U	50.0	49.6		ug/L		99	80 - 120	3	20
Bromoform	2.0	U	50.0	52.4		ug/L		105	66 - 130	2	20
Bromomethane	10	U	50.0	46.8		ug/L		94	53 - 141	3	20
Carbon disulfide	1.0	U	50.0	46.4		ug/L		93	64 - 133	5	20
Carbon tetrachloride	1.0	U	50.0	44.0		ug/L		88	72 - 136	4	20
Chlorobenzene	0.50	U	50.0	48.1		ug/L		96	82 - 118	3	20
Chlorobromomethane	1.0	U	50.0	44.5		ug/L		89	78 - 123	9	20
Chlorodibromomethane	1.0	U	50.0	45.9		ug/L		92	74 - 126	5	20
Chloroethane	10	U	50.0	57.9		ug/L		116	60 - 138	9	20
Chloroform	1.0	U	50.0	45.0		ug/L		90	79 - 124	4	20
Chloromethane	2.0	U Q	50.0	38.6	M	ug/L		77	50 - 139	11	20
cis-1,2-Dichloroethene	1.0	U	50.0	44.9		ug/L		90	78 - 123	4	20
cis-1,3-Dichloropropene	1.0	U	50.0	41.4		ug/L		83	75 - 124	4	20
Dibromomethane	1.0	U	50.0	45.9		ug/L		92	79 - 123	3	20
Dichlorobromomethane	1.0	U	50.0	44.4		ug/L		89	79 - 125	3	20
Dichlorodifluoromethane	1.0	U	50.0	44.6		ug/L		89	32 - 152	9	20
Ethylbenzene	0.50	U	50.0	48.1		ug/L		96	79 - 121	4	20
Ethylene Dibromide	1.0	U	50.0	49.8		ug/L		100	75 - 127	3	20
Hexachlorobutadiene	1.0	U	50.0	45.3		ug/L		91	66 - 134	6	20
Isopropylbenzene	1.0	U	50.0	45.5		ug/L		91	72 - 131	5	20
Methyl tert-butyl ether	2.0	U	50.0	47.5		ug/L		95	71 - 124	4	20
Methylene Chloride	10	U	50.0	46.1		ug/L		92	74 - 124	3	20
m-Xylene & p-Xylene	1.0	U	50.0	45.4		ug/L		91	80 - 121	4	20
Naphthalene	5.0	U	50.0	56.0		ug/L		112	61 - 128	3	20
n-Butylbenzene	2.0	U	50.0	43.9		ug/L		88	75 - 128	5	20
N-Propylbenzene	1.0	U	50.0	45.0		ug/L		90	76 - 126	5	20
o-Xylene	1.0	U	50.0	44.9		ug/L		90	78 - 122	5	20
sec-Butylbenzene	2.0	U	50.0	43.2		ug/L		86	77 - 126	4	20
Styrene	1.0	U	50.0	46.4		ug/L		93	78 - 123	2	20
tert-Butylbenzene	1.0	U	50.0	44.6		ug/L		89	78 - 124	3	20
Tetrachloroethene	1.0	U	50.0	48.1		ug/L		96	74 - 129	4	20
Toluene	1.0	U	50.0	48.4		ug/L		97	80 - 121	4	20
trans-1,2-Dichloroethene	1.0	U	50.0	46.1		ug/L		92	75 - 124	3	20
trans-1,3-Dichloropropene	1.0	U	50.0	40.8		ug/L		82	73 - 127	6	20
Trichloroethene	0.50	U	50.0	50.2		ug/L		100	79 - 123	4	20
Trichlorofluoromethane	1.0	U	50.0	48.1		ug/L		96	65 - 141	8	20
Vinyl acetate	2.0	U Q	100	79.0		ug/L		79	54 - 146	1	20
Vinyl chloride	1.0	U	50.0	47.6		ug/L		95	58 - 137	9	20
Xylenes, Total	1.0	U	100	90.3		ug/L		90	79 - 121	4	20

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 680-214975-3 MSD
 Matrix: Water
 Analysis Batch: 721049

Client Sample ID: 32M-01-17XBR-SPR22
 Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	95		85 - 114
Dibromofluoromethane (Surr)	94		80 - 119
Toluene-d8 (Surr)	98		89 - 112
1,2-Dichloroethane-d4 (Surr)	89		81 - 118

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-719607/1-A
 Matrix: Water
 Analysis Batch: 720047

Client Sample ID: Method Blank
 Prep Type: Total Recoverable
 Prep Batch: 719607

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Manganese	5.0	U	10	5.0	1.3	ug/L		05/09/22 13:07	1

Lab Sample ID: LCS 680-719607/2-A
 Matrix: Water
 Analysis Batch: 720047

Client Sample ID: Lab Control Sample
 Prep Type: Total Recoverable
 Prep Batch: 719607

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	400	405		ug/L		101	90 - 114

Lab Sample ID: 680-214975-3 MS
 Matrix: Water
 Analysis Batch: 720047

Client Sample ID: 32M-01-17XBR-SPR22
 Prep Type: Total Recoverable
 Prep Batch: 719607

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	39		400	437		ug/L		99	90 - 114

Lab Sample ID: 680-214975-3 MSD
 Matrix: Water
 Analysis Batch: 720047

Client Sample ID: 32M-01-17XBR-SPR22
 Prep Type: Total Recoverable
 Prep Batch: 719607

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Manganese	39		400	434		ug/L		99	90 - 114	1	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 680-719565/1-A
 Matrix: Water
 Analysis Batch: 719967

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 719565

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		05/09/22 16:49	1

Lab Sample ID: LCS 680-719565/2-A
 Matrix: Water
 Analysis Batch: 719967

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 719565

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	98.5		ug/L		98	84 - 116

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 680-214975-3 MS

Matrix: Water

Analysis Batch: 719967

Client Sample ID: 32M-01-17XBR-SPR22

Prep Type: Total/NA

Prep Batch: 719565

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	1.3	J	100	107		ug/L		105	84 - 116

Lab Sample ID: 680-214975-3 MSD

Matrix: Water

Analysis Batch: 719967

Client Sample ID: 32M-01-17XBR-SPR22

Prep Type: Total/NA

Prep Batch: 719565

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	1.3	J	100	104		ug/L		103	84 - 116	3	20

QC Association Summary

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

GC/MS VOA

Analysis Batch: 720836

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-214975-1	32M-01-13XBR-SPR22	Total/NA	Water	8260B	
MB 680-720836/9	Method Blank	Total/NA	Water	8260B	
LCS 680-720836/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-720836/5	Lab Control Sample Dup	Total/NA	Water	8260B	

Analysis Batch: 721049

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-214975-2	32M-01-14XOB-SPR22	Total/NA	Water	8260B	
680-214975-3	32M-01-17XBR-SPR22	Total/NA	Water	8260B	
680-214975-4	32M-01-18XBR-SPR22	Total/NA	Water	8260B	
680-214975-5	AOC32-DUP01-SPR22	Total/NA	Water	8260B	
MB 680-721049/44	Method Blank	Total/NA	Water	8260B	
LCS 680-721049/39	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-721049/40	Lab Control Sample Dup	Total/NA	Water	8260B	
680-214975-3 MS	32M-01-17XBR-SPR22	Total/NA	Water	8260B	
680-214975-3 MSD	32M-01-17XBR-SPR22	Total/NA	Water	8260B	

Metals

Prep Batch: 719565

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-214975-1	32M-01-13XBR-SPR22	Total/NA	Water	3010A	
680-214975-2	32M-01-14XOB-SPR22	Total/NA	Water	3010A	
680-214975-3	32M-01-17XBR-SPR22	Total/NA	Water	3010A	
680-214975-4	32M-01-18XBR-SPR22	Total/NA	Water	3010A	
680-214975-5	AOC32-DUP01-SPR22	Total/NA	Water	3010A	
MB 680-719565/1-A	Method Blank	Total/NA	Water	3010A	
LCS 680-719565/2-A	Lab Control Sample	Total/NA	Water	3010A	
680-214975-3 MS	32M-01-17XBR-SPR22	Total/NA	Water	3010A	
680-214975-3 MSD	32M-01-17XBR-SPR22	Total/NA	Water	3010A	

Prep Batch: 719607

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-214975-1	32M-01-13XBR-SPR22	Total Recoverable	Water	3005A	
680-214975-2	32M-01-14XOB-SPR22	Total Recoverable	Water	3005A	
680-214975-3	32M-01-17XBR-SPR22	Total Recoverable	Water	3005A	
680-214975-4	32M-01-18XBR-SPR22	Total Recoverable	Water	3005A	
680-214975-5	AOC32-DUP01-SPR22	Total Recoverable	Water	3005A	
MB 680-719607/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-719607/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-214975-3 MS	32M-01-17XBR-SPR22	Total Recoverable	Water	3005A	
680-214975-3 MSD	32M-01-17XBR-SPR22	Total Recoverable	Water	3005A	

Analysis Batch: 719967

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-214975-1	32M-01-13XBR-SPR22	Total/NA	Water	6020A	719565
680-214975-2	32M-01-14XOB-SPR22	Total/NA	Water	6020A	719565
680-214975-3	32M-01-17XBR-SPR22	Total/NA	Water	6020A	719565
680-214975-4	32M-01-18XBR-SPR22	Total/NA	Water	6020A	719565
680-214975-5	AOC32-DUP01-SPR22	Total/NA	Water	6020A	719565
MB 680-719565/1-A	Method Blank	Total/NA	Water	6020A	719565

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QC Association Summary

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

Metals (Continued)

Analysis Batch: 719967 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 680-719565/2-A	Lab Control Sample	Total/NA	Water	6020A	719565
680-214975-3 MS	32M-01-17XBR-SPR22	Total/NA	Water	6020A	719565
680-214975-3 MSD	32M-01-17XBR-SPR22	Total/NA	Water	6020A	719565

Analysis Batch: 720047

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-214975-1	32M-01-13XBR-SPR22	Total Recoverable	Water	6010C	719607
680-214975-2	32M-01-14XOB-SPR22	Total Recoverable	Water	6010C	719607
680-214975-3	32M-01-17XBR-SPR22	Total Recoverable	Water	6010C	719607
680-214975-4	32M-01-18XBR-SPR22	Total Recoverable	Water	6010C	719607
680-214975-5	AOC32-DUP01-SPR22	Total Recoverable	Water	6010C	719607
MB 680-719607/1-A	Method Blank	Total Recoverable	Water	6010C	719607
LCS 680-719607/2-A	Lab Control Sample	Total Recoverable	Water	6010C	719607
680-214975-3 MS	32M-01-17XBR-SPR22	Total Recoverable	Water	6010C	719607
680-214975-3 MSD	32M-01-17XBR-SPR22	Total Recoverable	Water	6010C	719607



Lab Chronicle

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

Client Sample ID: 32M-01-13XBR-SPR22

Lab Sample ID: 680-214975-1

Date Collected: 05/03/22 14:45

Matrix: Water

Date Received: 05/05/22 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	720836	05/14/22 19:44	EMA	TAL SAV
Instrument ID: CMSC										
Total Recoverable	Prep	3005A			50 mL	50 mL	719607	05/06/22 15:21	JE	TAL SAV
Total Recoverable	Analysis	6010C		1			720047	05/09/22 18:18	BCB	TAL SAV
Instrument ID: ICPH										
Total/NA	Prep	3010A			50 mL	250 mL	719565	05/06/22 12:16	JE	TAL SAV
Total/NA	Analysis	6020A		1			719967	05/09/22 17:20	BWR	TAL SAV
Instrument ID: ICPMSD										

Client Sample ID: 32M-01-14XOB-SPR22

Lab Sample ID: 680-214975-2

Date Collected: 05/03/22 12:15

Matrix: Water

Date Received: 05/05/22 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	721049	05/17/22 05:02	EMA	TAL SAV
Instrument ID: CMSAA										
Total Recoverable	Prep	3005A			50 mL	50 mL	719607	05/06/22 15:21	JE	TAL SAV
Total Recoverable	Analysis	6010C		1			720047	05/09/22 18:27	BCB	TAL SAV
Instrument ID: ICPH										
Total/NA	Prep	3010A			50 mL	250 mL	719565	05/06/22 12:16	JE	TAL SAV
Total/NA	Analysis	6020A		1			719967	05/09/22 17:22	BWR	TAL SAV
Instrument ID: ICPMSD										

Client Sample ID: 32M-01-17XBR-SPR22

Lab Sample ID: 680-214975-3

Date Collected: 05/03/22 16:20

Matrix: Water

Date Received: 05/05/22 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	721049	05/17/22 10:52	EMA	TAL SAV
Instrument ID: CMSAA										
Total Recoverable	Prep	3005A			50 mL	50 mL	719607	05/06/22 15:21	JE	TAL SAV
Total Recoverable	Analysis	6010C		1			720047	05/09/22 13:13	BCB	TAL SAV
Instrument ID: ICPH										
Total/NA	Prep	3010A			50 mL	250 mL	719565	05/06/22 12:16	JE	TAL SAV
Total/NA	Analysis	6020A		1			719967	05/09/22 16:54	BWR	TAL SAV
Instrument ID: ICPMSD										

Client Sample ID: 32M-01-18XBR-SPR22

Lab Sample ID: 680-214975-4

Date Collected: 05/03/22 12:55

Matrix: Water

Date Received: 05/05/22 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	721049	05/17/22 05:25	EMA	TAL SAV
Instrument ID: CMSAA										

Lab Chronicle

Client: Seres Engineering & Services LLC
 Project/Site: AOC 32/43A

Job ID: 680-214975-1

Client Sample ID: 32M-01-18XBR-SPR22

Lab Sample ID: 680-214975-4

Date Collected: 05/03/22 12:55

Matrix: Water

Date Received: 05/05/22 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	719607	05/06/22 15:21	JE	TAL SAV
Total Recoverable	Analysis	6010C		1			720047	05/09/22 18:30	BCB	TAL SAV
Instrument ID: ICPH										
Total/NA	Prep	3010A			50 mL	250 mL	719565	05/06/22 12:16	JE	TAL SAV
Total/NA	Analysis	6020A		1			719967	05/09/22 17:25	BWR	TAL SAV
Instrument ID: ICPMSD										

Client Sample ID: AOC32-DUP01-SPR22

Lab Sample ID: 680-214975-5

Date Collected: 05/03/22 12:55

Matrix: Water

Date Received: 05/05/22 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	721049	05/17/22 05:49	EMA	TAL SAV
Instrument ID: CMSAA										
Total Recoverable	Prep	3005A			50 mL	50 mL	719607	05/06/22 15:21	JE	TAL SAV
Total Recoverable	Analysis	6010C		1			720047	05/09/22 18:33	BCB	TAL SAV
Instrument ID: ICPH										
Total/NA	Prep	3010A			50 mL	250 mL	719565	05/06/22 12:16	JE	TAL SAV
Total/NA	Analysis	6020A		1			719967	05/09/22 17:27	BWR	TAL SAV
Instrument ID: ICPMSD										

Laboratory References:

= Katahdin Analytical Services Inc, 600 Technology Way, Scarborough, ME 04074
 TAL SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Project/Site: AOC 32/43A

Job ID: 680-214975-1

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	09-18-22

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Method Summary

Client: Seres Engineering & Services LLC
Project/Site: AOC 32/43A

Job ID: 680-214975-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV
6020A	Metals (ICP/MS)	SW846	TAL SAV
MA-VPH	MADEP VPH Volatile Petroleum Hydrocarbon	MA DEP	
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL SAV
3010A	Preparation, Total Metals	SW846	TAL SAV
5030B	Purge and Trap	SW846	TAL SAV

Protocol References:

MA DEP = Massachusetts Department Of Environmental Protection

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

= Katahdin Analytical Services Inc, 600 Technology Way, Scarborough, ME 04074

TAL SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

MassDEP Analytical Protocol Certification Form

Laboratory Name: Katahdin Analytical Services, LLC.

Project #:

Project Location: Fort Devens

RTN:

This Form provides certifications for the following data set: list Laboratory Sample ID Number(s):
SP

Matrices: Groundwater/Surface Water • Soil/Sediment • Drinking Water • Air • Other: _____

CAM Protocol (check all that apply below):

8260 VOC CAM II A •	7470/7471 Hg CAM III B •	MassDEP VPH CAM IV A <input checked="" type="checkbox"/>	8081 Pesticides CAM V B •	7196 Hex Cr CAM VI B •	MassDEP APH CAM IX A •
8270 SVOC CAM II B •	7010 Metals CAM III C •	MassDEP EPH CAM IV B •	8151 Herbicides CAM V C •	8330 Explosives CAM VIII A •	TO-15 VOC CAM IX B •
6010 Metals CAM III A •	6020 Metals CAM III D •	8082 PCB CAM V A •	9014 Total Cyanide/PAC CAM VI A •	6860 Perchlorate CAM VIII B •	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	X Yes • No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	X Yes • No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	X Yes • No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	X Yes • No
E	VPH, EPH, APH, and TO-15 only: a. VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	X Yes • No X Yes • No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	X Yes X No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	X Yes • No ¹
----------	---	-------------------------

Data User Note: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.

H	Were all QC performance standards specified in the CAM protocol(s) achieved?	X Yes • No ¹
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	X Yes • No ¹

¹All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: _____

Position: Q.A. Officer

Printed Name: Leslie Dimond

Date: 05/26/2022

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TEST AMERICA SAVANNAH

FORT DEVENS - LTM - AOC 32/43A

SP2157

Ms. Leslie Dimond
207-874-2400

KATAHDIN ANALYTICAL SERVICES
600 TECHNOLOGY WAY
SCARBOROUGH, ME 04074

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Total number of pages: 168

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SAMPLE DATA PACKAGE

NARRATIVE
KATAHDIN ANALYTICAL SERVICES
TEST AMERICA SAVANNAH
FORT DEVENS – LTM – AOC 32/43A
SP2157

Sample Receipt

The following samples were received on May 07, 2022 and were logged in under Katahdin Analytical Services work order number SP2157 for a hardcopy due date of May 21, 2022.

<u>Sample No.</u>	<u>Sample Identification</u>
SP2157-1	32M-01-13XBR-SPR22
SP2157-2	32M-01-14XOB-SPR22
SP2157-3	32M-01-17XBR-SPR22
SP2157-4	32M-01-18XBR-SPR22
SP2157-5	AOC32-DUP01-SPR22

The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

We certify that the test results provided in this report meet all the requirements of the NELAP standards unless otherwise noted in this narrative or in the Report of Analysis.

We certify that the test results provided in this report are accredited under the laboratory's ISO/IEC 17025:2017 and DoD-ELAP accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation L2223.

Analytes which are reported but not listed on our ANAB scope of accreditation will be “^” flagged and the following language will be included in the case narrative for all DoD compliant work: “^” Indicates this analyte is not included on Katahdin Analytical Services DoD-ELAP Scope of Accreditation.

Sample analyses have been performed by the methods as noted herein.

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact your Katahdin Analytical Services Project Manager, **Ms. Heather Manz**. This narrative is an integral part of the Report of Analysis.

Organics Analysis

The samples of Work Order SP2157 was analyzed in accordance with Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Third Edition, Final Updates I (1993), II (1995), IIA (1994), IIB (1995), III (1997), IIIA (1999), IIIB (2005), IV (2008), and V (2015), and/or for the specific methods listed below or on the Report of Analysis.

MA VPH Analysis

Sample SP2157-3 was used for the matrix spike (MS) and matrix spike duplicate (MSD) as request by the client.

There were no other protocol deviations or observations noted by the organics laboratory staff.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized the Quality Assurance Officer, or their designee, as verified by the following signature.

Leslie Dimond
Quality Assurance Officer

Katahdin Analytical Services, Inc.

Manual Integration Codes For GC/MS, GC, HPLC and/or IC

M1	Peak splitting.
M2	Well defined peaks on the shoulders of the other peaks.
M3	There is additional area due to a coeluting interferant.
M4	There are negative spikes in the baseline.
M5	There are rising or falling baselines.
M6	The software has failed to detect a peak or misidentified a peak.
M7	Excessive peak tailing.
M8	Analysis such as GRO, DRO and TPH require a baseline hold.
M9	Peak was not completely integrated as in GC/MS.
M10	Primary ion was correctly integrated, but secondary or tertiary ion needed manual integration as in GC/MS.
M11	For GC analysis, when a sample is diluted by 1:10 or more, the surrogate is set to undetected and then the area under the surrogate is manually integrated.
M12	Manual integration saved in method due to TurboChrom floating point error.

Katahdin Analytical Services, LLC.

Sample Receipt Condition Report

Client: <u>Eurofins TA-Sav.</u>	KAS PM: <u>HHM</u>	Sampled By: <u>Client</u>
Project:	KIMS Entry By: <u>JCB</u>	Delivered By: <u>Fedex</u>
KAS Work Order#: <u>SP2157</u>	KIMS Review By: <u>HHM</u>	Received By: <u>JCB</u>
	Labeled By: <u>EP</u>	
SDG #:	Cooler: <u>1</u> of <u>1</u>	Date/Time Rec.: <u>5/7/22 1000</u>

Receipt Criteria	Y	N	EX*	NA	Comments and/or Resolution
1. Custody seals present / intact?	/				
2. Chain of Custody present in cooler?	/				
3. Chain of Custody signed by client?	/				
4. Chain of Custody matches samples?	/				
5. Temperature Blanks present? If not, take temperature of any sample w/ IR gun.	/	/			Temp (°C): <u>0.7</u> Thermometer ID: <u>IR-1</u>
Samples received at <6 °C w/o freezing?	/				Note: Not required for metals (except Hg soil) analysis.
Ice packs or ice present?	/				The lack of ice or ice packs (i.e. no attempt to begin cooling process) or insufficient ice may not meet certain regulatory requirements and may invalidate certain data.
If yes, was there sufficient ice to meet temperature requirements?	/				
If temp. out, has the cooling process begun (i.e. ice or packs present) and sample collection times <6hrs., but samples are not yet cool?				/	Note: No cooling process required for metals (except Hg soil) analysis.
6. Volatiles:				/	
Aqueous: No bubble larger than a pea?				/	
Soil/Sediment:				/	
Received in airtight container?				/	
Received in methanol?				/	
Methanol covering soil?				/	
D.I. Water - Received within 48 hour HT?				/	
7. Trip Blank present in cooler?	/				
8. Proper sample containers and volume?	/				
9. Samples within hold time upon receipt?	/				
10. Aqueous samples properly preserved?				/	
Metals, COD, NH3, TKN, O/G, phenol, TPO4, N+N, TOC, DRO, TPH – pH <2				/	
Sulfide - >9				/	
Cyanide – pH >12				/	

11. Bottleware Prepped on:

* Log-In Notes to Exceptions: document any problems with samples or discrepancies or pH adjustments.

Chain of Custody Record



SP2157

Client Information (Sub Contract Lab)		Lab PM: Lanier, Jerry A		Garner Tracking No(s): 680-693169-1			
Client Contact: Shipping/Receiving		E-Mail: Jerry.Lanier@et.eurofins.com		Page: Page 1 of 1			
Company: Katahdin Analytical Services		State of Origin: Massachusetts		Job #: 680-214975-1			
Address: 600 Technology Way,		Accreditations Required (See note): Dept. of Defense ELAP - A2LLA; DoD - ANAB		Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid I - Ice J - DI Water U - Acetone V - MCAA W - pH 4-5 K - EDTA L - EDA Z - other (specify) Other:			
City: Scarborough		Due Date Requested: 5/17/2022		Analysis Requested:			
State, Zip: ME, 04074		TAT Requested (days):		Total Number of containers			
Phone:		PO #:		SUB (MA VPH + BTEX)/ MA VPH			
Email:		WO #:		Perform MS/MSD (Yes or No)			
Project Name: AOC 32/43A		Project #: 68023801		Field Filtered Sample (Yes or No)			
Site:		SSOW#:		Preservation Code:			
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (Newwater, Seawater, Onwastewater, BT=Issue, AA=IP)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Special Instructions/Note:
32M-01-13XBR-SPR22 (680-214975-1)	5/3/22	14:45 Eastern		Water		X	
32M-01-14XOB-SPR22 (680-214975-2)	5/3/22	12:15 Eastern		Water		X	
32M-01-17XBR-SPR22 (680-214975-3)	5/3/22	16:20 Eastern		Water		X	
32M-01-17XBR-SPR22 (680-214975-3MS)	5/3/22	16:20 Eastern	MS	Water		X	
32M-01-17XBR-SPR22 (680-214975-3MSD)	5/3/22	16:20 Eastern	MSD	Water		X	
32M-01-18XBR-SPR22 (680-214975-4)	5/3/22	12:55 Eastern		Water		X	
AOC32-DUP01-SPR22 (680-214975-5)	5/3/22	12:55 Eastern		Water		X	
<p>Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing Southeast, LLC places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/retests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Southeast, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Southeast, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Southeast, LLC.</p>							
<p>Possible Hazard Identification</p> <p>Unconfirmed <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For <input type="checkbox"/> Months</p> <p>Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2</p> <p>Special Instructions/QC Requirements:</p>							
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:	
Relinquished by: <i>[Signature]</i>		Date/Time: 5/16		Company: 1000		Received by: <i>[Signature]</i>	
Relinquished by:		Date/Time:		Company:		Date/Time: 5/7/22	
Relinquished by:		Date/Time:		Company:		Date/Time: 1000	
Relinquished by:		Date/Time:		Company:		Date/Time:	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		Company: KAS	





Katahdin Analytical Services

Login Chain of Custody (In01)

May. 09, 2022
05:33 PM

Login Number: SP2157

Account: TASAV001
Test America Savannah
Project: TASAV-DEVENS

Quote/Incoming: TASAV-DEVENS

Login Information

Primary Report Address:

Jerry Lanier
Test America Savannah
5102 LaRoche Avenue

Savannah, GA 31404

Jerry.Lanier@testamericainc.com

Primary Invoice Address:

Accounts Payable
Test America Savannah
5102 LaRoche Avenue

Savannah, GA 31404

email project manager

Report CC Addresses:

Invoice CC Addresses:

ANALYSIS INSTRUCTIONS : FDS, DOD QSM 5.3 reporting with DOD limits. ND to LOD. "J" flag between MDL and PQL. Need LCS/LCSD. Follow MA MCP CAM. Include level 4 narrative.

CHECK NO. :
CLIENT PO# : 68023801, 680-214975

CLIENT PROJECT MANAGE : Jerry Lanier

CONTRACT :

COOLER TEMPERATURE : 0.7

DELIVERY SERVICES : FedEx

EDD FORMAT : ECC-091317-TXT

ISM INSTRUCTIONS :

LOGIN INITIALS : JCB

PM : HHM

PROJECT NAME : Fort Devens - LTM - AOC 32/43A

QC LEVEL : IV

REPORT INSTRUCTIONS : SDS needs all forms. Include Level 4 narrative and MCP forms (from Leslie). Send level 4 PDF & level 2 PDF. Level 2= SDP & SDS. Upload EDD to Ft. Devens Database. Email PDF, EDD, and invoice to Beth.Daughtry@Eurofinset.com & Jerry.Lanier@et.eurofinsus.com. No HC.

SDG ID :

SDG STATUS :

VERBAL TAT :



Login Number: SP2157
Quote/Incoming: TASAV-DEVENS
Account: TASAV001

Test America Savannah

Project: TASAV-DEVENS

Laboratory Sample ID	Client Sample Number	Collect Date/Time	Receive Date	PR	Due Date	Verbal Due Date	Mailed
SP2157-1	32M-01-13XBR-SPR22	03-MAY-22 14:45	07-MAY-22		21-MAY-22		
Sample Comments: 680-214975-1.							
<i>Matrix</i>	<i>Product</i>	<i>Hold Date (shortest)</i>	<i>Notes</i>		<i>Bottle Type</i>		
Aqueous	S MA-VPH	17-MAY-22			40mL Vial+HCl		
SP2157-2	32M-01-14XOB-SPR22	03-MAY-22 12:15	07-MAY-22		21-MAY-22		
Sample Comments: 680-214975-2.							
<i>Matrix</i>	<i>Product</i>	<i>Hold Date (shortest)</i>	<i>Notes</i>		<i>Bottle Type</i>		
Aqueous	S MA-VPH	17-MAY-22			40mL Vial+HCl		
SP2157-3	32M-01-17XBR-SPR22	03-MAY-22 16:20	07-MAY-22		21-MAY-22		
Sample Comments: MS/MSD, 680-214975-3.							
<i>Matrix</i>	<i>Product</i>	<i>Hold Date (shortest)</i>	<i>Notes</i>		<i>Bottle Type</i>		
Aqueous	S MA-VPH	17-MAY-22			40mL Vial+HCl		
SP2157-4	32M-01-18XBR-SPR22	03-MAY-22 12:55	07-MAY-22		21-MAY-22		
Sample Comments: 680-214975-4.							
<i>Matrix</i>	<i>Product</i>	<i>Hold Date (shortest)</i>	<i>Notes</i>		<i>Bottle Type</i>		
Aqueous	S MA-VPH	17-MAY-22			40mL Vial+HCl		
SP2157-5	AOC32-DUP01-SPR22	03-MAY-22 12:55	07-MAY-22		21-MAY-22		
Sample Comments: 680-214975-5.							
<i>Matrix</i>	<i>Product</i>	<i>Hold Date (shortest)</i>	<i>Notes</i>		<i>Bottle Type</i>		
Aqueous	S MA-VPH	17-MAY-22			40mL Vial+HCl		
SP2157-6	MS CHARGE 32M-01-17XBR-SPR	03-MAY-22 16:20	07-MAY-22		21-MAY-22		
Sample Comments: Not a sample, MS charge for SP2157-3.							
<i>Matrix</i>	<i>Product</i>	<i>Hold Date (shortest)</i>	<i>Notes</i>		<i>Bottle Type</i>		
Aqueous	S MA-VPH	17-MAY-22			40mL Vial+HCl		
SP2157-7	MSD CHARGE 32M-01-17XBR-SPR	03-MAY-22 16:20	07-MAY-22		21-MAY-22		
Sample Comments: Not a sample, MSD charge for SP2157-3.							
<i>Matrix</i>	<i>Product</i>	<i>Hold Date (shortest)</i>	<i>Notes</i>		<i>Bottle Type</i>		
Aqueous	S MA-VPH	17-MAY-22			40mL Vial+HCl		

Total Samples: 7
Total Analyses: 7

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SAMPLE DATA SUMMARY PACKAGE

KATAHDIN ANALYTICAL SERVICES - ORGANIC DATA QUALIFIERS

The sampled date indicated on the attached Report(s) of Analysis (ROA) is the date for which a grab sample was collected or the date for which a composite sample was completed. Beginning and start times for composite samples can be found on the Chain-of-Custody.

U Indicates the compound was analyzed for but not detected above the specified level. This level may be the Limit of Quantitation (LOQ)(previously called Practical Quantitation Level (PQL)), the Limit of Detection (LOD) or Method Detection Limit (MDL) as required by the client.

Note: All results reported as "U" MDL have a 50% rate for false negatives compared to those results reported as "U" PQL/LOQ or "U" LOD, where the rate of false negatives is <1%.

* Compound recovery or percent RPD (relative percent difference) was outside of quality control limits.

D Indicates the result was obtained from analysis of a diluted sample. Surrogate recoveries may not be calculable.

E Estimated value. This flag identifies compounds whose concentrations exceed the upper level of the calibration range of the instrument for that specific analysis.

J Estimated value. The analyte was detected in the sample at a concentration less than the laboratory Limit of Quantitation (LOQ)(previously called Practical Quantitation Limit (PQL)), but above the Method Detection Limit (MDL).

or

J Used for Pesticides, PCBs, Herbicides, Formaldehyde, Explosives and Method 504.1 analytes when there is a greater than 40% difference for detected concentrations between the two GC columns.

B Indicates the analyte was detected in the laboratory method blank analyzed concurrently with the sample.

C Indicates that the flagged compound did not meet DoD criteria in the corresponding daily calibration verification (CV).

L Indicates that the flagged compound did not meet DoD criteria in the corresponding Laboratory Control Sample (LCS) and/or Laboratory Control Sample Duplicate (LCSD) prepared and/or analyzed concurrently with the sample.

M Indicates that the flagged compound did not meet DoD criteria in the Matrix Spike and/or Matrix Spike Duplicate prepared and/or analyzed concurrently with the native sample.

N Presumptive evidence of a compound based on a mass spectral library search.

A Indicates that a tentatively identified compound is a suspected aldol-condensation product.

P Used for Pesticide/Aroclor analyte when there is a greater than 25% difference for detected concentrations between the two GC columns. (for CLP methods only).

Report of Analytical Results

SDG: SP2157
Lab ID: SP2157-1
Client ID: 32M-01-13XBR-SPR22
Matrix: AQ
Lab File ID: 2PE10038.D

Sample Date: 03-MAY-22
Extract Date: 10-MAY-22
Extracted By: DL/GM
Extraction Method: MA-VPH
Lab Prep Batch: WG317886

Report Date: 01-JUN-22
Analysis Date: 10-MAY-22
Analyst: DL/GM
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		95.0	%					
2,5-Dibromotoluene (PID)		89.7	%					

Report of Analytical Results

SDG: SP2157
Lab ID: SP2157-2
Client ID: 32M-01-14XOB-SPR22
Matrix: AQ
Lab File ID: 2PE10039.D

Sample Date: 03-MAY-22
Extract Date: 10-MAY-22
Extracted By: DL/GM
Extraction Method: MA-VPH
Lab Prep Batch: WG317886

Report Date: 01-JUN-22
Analysis Date: 10-MAY-22
Analyst: DL/GM
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		82.4	%					
2,5-Dibromotoluene (PID)		74.8	%					

Report of Analytical Results

SDG: SP2157
Lab ID: SP2157-3
Client ID: 32M-01-17XBR-SPR22
Matrix: AQ
Lab File ID: 2PE10040.D

Sample Date: 03-MAY-22
Extract Date: 10-MAY-22
Extracted By: DL/GM
Extraction Method: MA-VPH
Lab Prep Batch: WG317886

Report Date: 01-JUN-22
Analysis Date: 10-MAY-22
Analyst: DL/GM
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		105.	%					
2,5-Dibromotoluene (PID)		98.0	%					

Report of Analytical Results

SDG: SP2157
Lab ID: SP2157-4
Client ID: 32M-01-18XBR-SPR22
Matrix: AQ
Lab File ID: 2PE10043.D

Sample Date: 03-MAY-22
Extract Date: 11-MAY-22
Extracted By: DL/GM
Extraction Method: MA-VPH
Lab Prep Batch: WG317886

Report Date: 01-JUN-22
Analysis Date: 11-MAY-22
Analyst: DL/GM
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics		210	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene		220	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		83.5	%					
2,5-Dibromotoluene (PID)		78.2	%					

Report of Analytical Results

SDG: SP2157
Lab ID: SP2157-5
Client ID: AOC32-DUP01-SPR22
Matrix: AQ
Lab File ID: 2PE10052.D

Sample Date: 03-MAY-22
Extract Date: 17-MAY-22
Extracted By: DL/GM
Extraction Method: MA-VPH
Lab Prep Batch: WG318300

Report Date: 01-JUN-22
Analysis Date: 17-MAY-22
Analyst: DL/GM
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics		200	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene		210	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		100.	%					
2,5-Dibromotoluene (PID)		89.4	%					

Report of Analytical Results

SDG: SP2157
Lab ID: WG317886-1
Client ID: Method Blank
Matrix: AQ
Lab File ID: 2PE10030.D

Sample Date: N/A
Extract Date: 10-MAY-22
Extracted By: DL/GM
Extraction Method: MA-VPH
Lab Prep Batch: WG317886

Report Date: 01-JUN-22
Analysis Date: 10-MAY-22
Analyst: DL/GM
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		94.1	%					
2,5-Dibromotoluene (PID)		97.2	%					

Report of Analytical Results

SDG: SP2157
Lab ID: WG318300-1
Client ID: Method Blank
Matrix: AQ
Lab File ID: 2PE10048.D

Sample Date: N/A
Extract Date: 17-MAY-22
Extracted By: DL/GM
Extraction Method: MA-VPH
Lab Prep Batch: WG318300

Report Date: 01-JUN-22
Analysis Date: 17-MAY-22
Analyst: DL/GM
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		99.9	%					
2,5-Dibromotoluene (PID)		88.0	%					

Form 2 System Monitoring Compound Recovery

Lab Name: Katahdin Analytical Services **SDG:** SP2157

Matrix: AQ

Client Sample ID	Lab Sample ID	Col. ID	DBT-FID #	DBT-PID #
32M-01-13XBR-SPR22	SP2157-1	B	95.0	89.7
32M-01-14XOB-SPR22	SP2157-2	B	82.4	74.8
32M-01-17XBR-SPR22	SP2157-3	B	105.	98.0
32M-01-18XBR-SPR22	SP2157-4	B	83.5	78.2
AOC32-DUP01-SPR22	SP2157-5	B	100.	89.4
Method Blank	WG317886-1	B	94.1	97.2
Laboratory Control S	WG317886-2	B	99.2	94.5
Laboratory Control S	WG317886-3	B	106.	108.
Matrix Spike	WG317886-8	B	108.	104.
Matrix Spike Duplica	WG317886-9	B	108.	105.
Method Blank	WG318300-1	B	99.9	88.0
Laboratory Control S	WG318300-2	B	106.	94.9
Laboratory Control S	WG318300-3	B	106.	95.2

QC Limits

DBT-FID	2,5-DIBROMOTOLUENE (FID)	70-130
DBT-PID	2,5-DIBROMOTOLUENE (PID)	70-130

= Column to be used to flag recovery limits.
 * = Values outside of contract required QC limits.
 D= System Monitoring Compound diluted out.

LCS/LCSD Recovery Report

LCS ID: WG317886-2
LCSD ID: WG317886-3
SDG: SP2157
LCS File ID: 2PE10031.D

Extract Date: 10-MAY-22
Extracted By: DL/GM
Extraction Method: MA-VPH
Lab Prep Batch: WG317886
LCSD File ID: 2PE10032.D

Analysis Date: 10-MAY-22
Analyst: DL/GM
Analysis Method: MA DEP VPH 04-1.1
Matrix: AQ
Report Date: 19-MAY-22

Compound	Spike Amt	LCS Conc	LCS Rec (%)	LCSD Conc	LCSD Rec (%)	Conc Units	RPD (%)	RPD Limit	Limits
C5-C8 Aliphatics	300.	271.	90.3	281.	93.7	ug/L	4	25	70-130
C9-C12 Aliphatics	200.	209.	104.	215.	108.	ug/L	3	25	70-130
C9-C10 Aromatics	100.	102.	102.	105.	105.	ug/L	3	25	70-130
Benzene	100.	94.9	94.9	95.6	95.6	ug/L	1	25	70-130
Ethylbenzene	100.	101.	101.	100.	100.	ug/L	1	25	70-130
Methyl tert-butylether	100.	92.4	92.4	95.8	95.8	ug/L	4	25	70-130
Naphthalene	100.	105.	105.	112.	112.	ug/L	6	25	70-130
Toluene	100.	97.9	97.9	97.3	97.3	ug/L	1	25	70-130
m+p-Xylenes	200.	197.	98.5	197.	98.5	ug/L	0	25	70-130
o-Xylene	100.	100.	100.	102.	102.	ug/L	2	25	70-130
2,5-Dibromotoluene (FID)			99.2		106.				70-130
2,5-Dibromotoluene (PID)			94.5		108.				70-130

LCS/LCSD Recovery Report

LCS ID: WG318300-2
LCSD ID: WG318300-3
SDG: SP2157
LCS File ID: 2PE10049.D

Extract Date: 17-MAY-22
Extracted By: DL/GM
Extraction Method: MA-VPH
Lab Prep Batch: WG318300
LCSD File ID: 2PE10050.D

Analysis Date: 17-MAY-22
Analyst: DL/GM
Analysis Method: MA DEP VPH 04-1.1
Matrix: AQ
Report Date: 19-MAY-22

Compound	Spike Amt	LCS Conc	LCS Rec (%)	LCSD Conc	LCSD Rec (%)	Conc Units	RPD (%)	RPD Limit	Limits
C5-C8 Aliphatics	300.	269.	89.7	258.	86.0	ug/L	4	25	70-130
C9-C12 Aliphatics	200.	204.	102.	205.	102.	ug/L	0	25	70-130
C9-C10 Aromatics	100.	96.6	96.6	97.4	97.4	ug/L	1	25	70-130
Benzene	100.	88.2	88.2	89.6	89.6	ug/L	2	25	70-130
Ethylbenzene	100.	93.2	93.2	94.6	94.6	ug/L	1	25	70-130
Methyl tert-butylether	100.	86.4	86.4	87.2	87.2	ug/L	1	25	70-130
Naphthalene	100.	98.7	98.7	99.7	99.7	ug/L	1	25	70-130
Toluene	100.	90.4	90.4	91.8	91.8	ug/L	2	25	70-130
m+p-Xylenes	200.	183.	91.5	185.	92.5	ug/L	1	25	70-130
o-Xylene	100.	93.8	93.8	94.7	94.7	ug/L	1	25	70-130
2,5-Dibromotoluene (FID)			106.		106.				70-130
2,5-Dibromotoluene (PID)			94.9		95.2				70-130

MS/MSD Recovery Report

MS ID: WG317886-8
MSD ID: WG317886-9
Sample ID: SP2157-3
Client ID: 32M-01-17XBR-SPR22
SDG: SP2157
MS File ID: 2PE10041.D

Extract Date: 11-MAY-22
Extracted By: DL/GM
Extraction Method: MA-VPH
Lab Prep Batch: WG317886
Report Date: 01-JUN-22
MSD File ID: 2PE10042.D

Analysis Date: 11-MAY-22
Analyst: DL/GM
Analysis Method: MA DEP VPH 04-1.1
Matrix: AQ
% Solids: NA

Compound	MS Spike	MSD Spike	Conc Units	Samp Conc	MS Conc	MSD Conc	MS Rec (%)	MSD Rec (%)	RPD (%)	RPD Limit	Limits
C5-C8 Aliphatics	300.	300.	ug/L	U75	276.	278.	92.0	92.7	1	50	70-130
C9-C12 Aliphatics	200.	200.	ug/L	U75	144.	145.	72.0	72.5	1	50	70-130
C9-C10 Aromatics	100	100	ug/L	U75	105	105	105.	105.	0	50	70-130
Benzene	100	100	ug/L	U2.0	97.8	98.2	97.8	98.2	0	50	70-130
Ethylbenzene	100	100	ug/L	U3.8	102	103	102.	103.	1	50	70-130
Methyl tert-butylether	100	100	ug/L	U3.8	91.2	91.7	91.2	91.7	0	50	70-130
Naphthalene	100	100	ug/L	U3.8	112	112	112.	112.	0	50	70-130
Toluene	100	100	ug/L	U3.8	100	100	100.	100.	0	50	70-130
m+p-Xylenes	200	200	ug/L	U7.5	200	200	100.	100.	0	50	70-130
o-Xylene	100	100	ug/L	U3.8	102	102	102.	102.	0	50	70-130
2,5-Dibromotoluene (FID)							108.	108.			70-130
2,5-Dibromotoluene (PID)							104.	105.			70-130

Form 4 Method Blank Summary

Lab Name : Katahdin Analytical Services
Lab Sample ID : WG317886-1
Lab File ID : 2PE10030.D
Instrument ID : GC02

SDG : SP2157
Date Analyzed : 10-MAY-22
Time Analyzed : 09:53
Date Extracted : 10-MAY-22

This Method Blank applies to the following samples and QC Samples:

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Laboratory Control S	WG317886-2	2PE10031.D	05/10/22	10:34
Laboratory Control S	WG317886-3	2PE10032.D	05/10/22	11:16
32M-01-13XBR-SPR22	SP2157-1	2PE10038.D	05/10/22	20:54
32M-01-14XOB-SPR22	SP2157-2	2PE10039.D	05/10/22	21:37
32M-01-17XBR-SPR22	SP2157-3	2PE10040.D	05/10/22	22:20
Matrix Spike	WG317886-8	2PE10041.D	05/10/22	23:03
Matrix Spike Duplica	WG317886-9	2PE10042.D	05/10/22	23:46
32M-01-18XBR-SPR22	SP2157-4	2PE10043.D	05/11/22	00:29

Form 4 Method Blank Summary

Lab Name : Katahdin Analytical Services
Lab Sample ID : WG318300-1
Lab File ID : 2PE10048.D
Instrument ID : GC02

SDG : SP2157
Date Analyzed : 17-MAY-22
Time Analyzed : 10:01
Date Extracted : 17-MAY-22

This Method Blank applies to the following samples and QC Samples:

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Laboratory Control S	WG318300-2	2PE10049.D	05/17/22	10:41
Laboratory Control S	WG318300-3	2PE10050.D	05/17/22	11:22
AOC32-DUP01-SPR22	SP2157-5	2PE10052.D	05/17/22	14:00



Form 4 Method Blank Summary

Lab Name : Katahdin Analytical Services
Lab Sample ID : WG317886-1
Lab File ID : 2PE10030.D
Instrument ID : GC02

SDG : SP2157
Date Analyzed : 10-MAY-22
Time Analyzed : 09:53
Date Extracted : 10-MAY-22

This Method Blank applies to the following samples and QC Samples:

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Laboratory Control S	WG317886-2	2PE10031.D	05/10/22	10:34
Laboratory Control S	WG317886-3	2PE10032.D	05/10/22	11:16
32M-01-13XBR-SPR22	SP2157-1	2PE10038.D	05/10/22	20:54
32M-01-14XOB-SPR22	SP2157-2	2PE10039.D	05/10/22	21:37
32M-01-17XBR-SPR22	SP2157-3	2PE10040.D	05/10/22	22:20
Matrix Spike	WG317886-8	2PE10041.D	05/10/22	23:03
Matrix Spike Duplica	WG317886-9	2PE10042.D	05/10/22	23:46
32M-01-18XBR-SPR22	SP2157-4	2PE10043.D	05/11/22	00:29



Form 7 Calibration Verification Summary

Lab Name: Katahdin Analytical Services **SDG:** SP2157
Lab ID: WG317886-4 **Analytical Date:** 05/10/22 08:44
Lab File ID: 2PE10029.D **Instrument ID:** GC02
Initial Calibration Date(s): 05/03/22 16:12 05/03/22 19:45 **Column ID:** B

Compound	RRF/Amount	RF50	Min RRF	%D/ %Drift	Max %D/ %Drift	Curve Type
C5-C8 Aliphatic	5755	5624	0.100	-2.27502	25.00000	Averaged
C9-C12 Aliphatic	5948	5889	0.100	-1.00623	25.00000	Averaged
n-Pentane	5178	4938	0.100	-4.63652	25.00000	Averaged
2-Methylpentane	5754	5623	0.100	-2.27942	25.00000	Averaged
Methyl tert-butylether	4276	4281	0.100	0.11022	25.00000	Averaged
2,2,4-Trimethylpentane	6334	6312	0.100	-0.34040	25.00000	Averaged
Benzene	7441	7368	0.100	-0.98289	25.00000	Averaged
Toluene	7222	7290	0.100	0.93269	25.00000	Averaged
n-Nonane	5746	5852	0.100	1.84241	30.00000	Averaged
n-Decane	5530	5556	0.100	0.46808	25.00000	Averaged
Ethylbenzene	6848	7069	0.100	3.21536	25.00000	Averaged
m+p-Xylene	7159	7279	0.100	1.68310	25.00000	Averaged
o-Xylene	7269	7452	0.100	2.51818	25.00000	Averaged
1,2,4-trimethylbenzene	6869	7292	0.100	6.15547	25.00000	Averaged
n-Butylcyclohexane	6367	6221	0.100	-2.28685	25.00000	Averaged
Naphthalene	5006	5143	0.100	2.73248	25.00000	Averaged
2,5-Dibromotoluene (FID)	2124	2236	0.100	5.28178	25.00000	Averaged

* = Compound out of QC criteria

Form 7 Calibration Verification Summary

Lab Name: Katahdin Analytical Services **SDG:** SP2157
Lab ID: WG318300-4 **Analytical Date:** 05/17/22 08:55
Lab File ID: 2PE10047.D **Instrument ID:** GC02
Initial Calibration Date(s): 05/03/22 16:12 05/03/22 19:45 **Column ID:** B

Compound	RRF/Amount	RF50	Min RRF	%D/ %Drift	Max %D/ %Drift	Curve Type
C5-C8 Aliphatic	5755	6092	0.100	5.84135	25.00000	Averaged
C9-C12 Aliphatic	5948	5763	0.100	-3.11866	25.00000	Averaged
n-Pentane	5178	5697	0.100	10.02032	25.00000	Averaged
2-Methylpentane	5754	6116	0.100	6.28266	25.00000	Averaged
Methyl tert-butylether	4276	4274	0.100	-0.04505	25.00000	Averaged
2,2,4-Trimethylpentane	6334	6462	0.100	2.02378	25.00000	Averaged
Benzene	7441	7431	0.100	-0.13057	25.00000	Averaged
Toluene	7222	7354	0.100	1.81549	25.00000	Averaged
n-Nonane	5746	5811	0.100	1.12330	30.00000	Averaged
n-Decane	5530	5423	0.100	-1.94414	25.00000	Averaged
Ethylbenzene	6848	7141	0.100	4.27604	25.00000	Averaged
m+p-Xylene	7159	7319	0.100	2.23726	25.00000	Averaged
o-Xylene	7269	7427	0.100	2.17700	25.00000	Averaged
1,2,4-trimethylbenzene	6869	7263	0.100	5.73331	25.00000	Averaged
n-Butylcyclohexane	6367	6103	0.100	-4.13931	25.00000	Averaged
Naphthalene	5006	5371	0.100	7.29835	25.00000	Averaged
2,5-Dibromotoluene (FID)	2124	2193	0.100	3.25914	25.00000	Averaged

* = Compound out of QC criteria

Form 7 Calibration Verification Summary

Lab Name: Katahdin Analytical Services **SDG:** SP2157
Lab ID: WG318300-5 **Analytical Date:** 05/17/22 16:44
Lab File ID: 2PE10056.D **Instrument ID:** GC02
Initial Calibration Date(s): 05/03/22 16:12 05/03/22 19:45 **Column ID:** B

Compound	RRF/Amount	RF50	Min RRF	%D/ %Drift	Max %D/ %Drift	Curve Type
C5-C8 Aliphatic	5755	5650	0.100	-1.82426	25.00000	Averaged
C9-C12 Aliphatic	5948	5229	0.100	-12.09039	25.00000	Averaged
n-Pentane	5178	5293	0.100	2.21779	25.00000	Averaged
2-Methylpentane	5754	5691	0.100	-1.10989	25.00000	Averaged
Methyl tert-butylether	4276	4220	0.100	-1.31063	25.00000	Averaged
2,2,4-Trimethylpentane	6334	5968	0.100	-5.77830	25.00000	Averaged
Benzene	7441	7518	0.100	1.04106	25.00000	Averaged
Toluene	7222	7460	0.100	3.28369	25.00000	Averaged
n-Nonane	5746	5220	0.100	-9.15095	30.00000	Averaged
n-Decane	5530	4817	0.100	-12.90329	25.00000	Averaged
Ethylbenzene	6848	7176	0.100	4.78302	25.00000	Averaged
m+p-Xylene	7159	7400	0.100	3.37700	25.00000	Averaged
o-Xylene	7269	7477	0.100	2.86046	25.00000	Averaged
1,2,4-trimethylbenzene	6869	7225	0.100	5.16908	25.00000	Averaged
n-Butylcyclohexane	6367	5642	0.100	-11.38487	25.00000	Averaged
Naphthalene	5006	5001	0.100	-0.10661	25.00000	Averaged
2,5-Dibromotoluene (FID)	2124	2011	0.100	-5.29564	25.00000	Averaged

* = Compound out of QC criteria

Form 8 GC Analytical Sequence

Lab Name : Katahdin Analytical Services
Instrument ID : GC02

SDG : SP2157

Client Sample ID	Lab Sample ID	Date Analyzed	Time Analyzed	DBT (FID)	DBT (PID)
Initial Calibration	WG317688-4	05/03/22	16:12	31.071	
Initial Calibration	WG317688-4	05/03/22	16:12		31.081
Initial Calibration	WG317688-1	05/03/22	16:54	31.078	
Initial Calibration	WG317688-1	05/03/22	16:54		31.087
Initial Calibration	WG317688-2	05/03/22	17:36	31.077	
Initial Calibration	WG317688-2	05/03/22	17:36		31.085
Initial Calibration	WG317688-3	05/03/22	18:19	31.077	
Initial Calibration	WG317688-3	05/03/22	18:19		31.084
Initial Calibration	WG317688-5	05/03/22	19:02	31.075	
Initial Calibration	WG317688-5	05/03/22	19:02		31.088
Initial Calibration	WG317688-6	05/03/22	19:45	31.079	
Initial Calibration	WG317688-6	05/03/22	19:45		31.08
Independent Source	WG317688-7	05/04/22	10:58	31.071	31.082
Continuing Calibrati	WG317886-4	05/10/22	08:44	31.059	31.069
Method Blank	WG317886-1	05/10/22	09:53	31.06	31.071
Laboratory Control S	WG317886-2	05/10/22	10:34	31.058	31.069
Laboratory Control S	WG317886-3	05/10/22	11:16	31.06	31.071
32M-01-13XBR-SPR22	SP2157-1	05/10/22	20:54	31.067	31.077
32M-01-14XOB-SPR22	SP2157-2	05/10/22	21:37	31.068	31.078
32M-01-17XBR-SPR22	SP2157-3	05/10/22	22:20	31.068	31.078
Matrix Spike	WG317886-8	05/10/22	23:03	31.067	31.077
Matrix Spike Duplica	WG317886-9	05/10/22	23:46	31.068	31.078
32M-01-18XBR-SPR22	SP2157-4	05/11/22	00:29	31.07	31.08
Continuing Calibrati	WG317886-5	05/11/22	01:55	31.069	31.08
Continuing Calibrati	WG318300-4	05/17/22	08:55	31.093	31.103
Method Blank	WG318300-1	05/17/22	10:01	31.093	31.103
Laboratory Control S	WG318300-2	05/17/22	10:41	31.093	31.103
Laboratory Control S	WG318300-3	05/17/22	11:22	31.094	31.104
AOC32-DUP01-SPR22	SP2157-5	05/17/22	14:00	31.096	31.106
Continuing Calibrati	WG318300-5	05/17/22	16:44	31.096	31.107

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Heather Levesque
669 Marina Drive, Suite B7, Charleston, SC 29492
(619) 370-0374, halevesque@seres-es.com

Boston COC # AOC32_SPR22
#215

Project Name: Former Fort Devens, Long Term Monitoring
Project Number: 30130800
WBS Code:

Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA
POC: Jerry Lanier, (912) 250-0281, jerry.lanier@et.eurofins.com
Ship to: Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404

Event: Seres-Arcadis JV, Long Term Monitoring, AOC 32/43A, Spring 2022

Sample ID	Matrix	Date	Time	Samp Init.	Analytical Test Method	MADEPVP (A)	SW6010C - Mn	SW6020A - As	SW8260B - VOCs	Sample Type	Location ID	Depth (ft bgs)		Cooler	Comments
												Top	Bottom		
1	WG	5-3-22	1445	DC		X	X	X	X	N1	32M-01-13XBR	13.70	23.70	1	
2	WG	5-3-22	1215	GS		X	X	X	X	N1	32M-01-14XOB	17.30	27.30	1	
3	WG	5-3-22	1620	SG		X	X	X	X	MS1	32M-01-17XBR	41.40	51.40	1	
4	WG	5-3-22	1620	SG		X	X	X	X	N1	32M-01-17XBR	41.40	51.40	1	
5	WG	5-3-22	1620	SG		X	X	X	X	SD1	32M-01-17XBR	41.40	51.40	1	
6	WG	5-3-22	1255	DC		X	X	X	X	N1	32M-01-18XBR	14.00	24.00	1	
7	WG	5-3-22	1255	DC		X	X	X	X	FD1	32M-01-18XBR	14.00	24.00	1	
8															
9															
10															

Code	Container/Preservative
4	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
9	1x 250mL, plastic, HNO3, pH < 2; Cool < 6degC
29	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC

Code	Matrix
WG	Ground Water



Handwritten: 5/15 1048

Handwritten: 5/13/22 1715

Relinquished by: *Heather Levesque*
Date: 5/3/22
Time: 17:15

Received by:
Date
Time

- 1
- 2
- 3
- 4
- 5
- 6
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- 8
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- 11
- 12
- 13

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-214975-1

Login Number: 214975

List Number: 1

Creator: Watters, David

List Source: Eurofins Savannah

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



ANALYTICAL REPORT

Eurofins Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-215136-1
Client Project/Site: Fort Devens, DCL, Spring 2022

For:

Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Attn: Heather Levesque



Authorized for release by:
6/13/2022 5:08:56 PM

Jerry Lanier, Project Manager I
(912)250-0281
Jerry.Lanier@et.eurofinsus.com

LINKS

Review your project
results through



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The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, DCL, Spring 2022

Job ID: 680-215136-1

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

HPLC/IC

Qualifier	Qualifier Description
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

Metals

Qualifier	Qualifier Description
B	Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

General Chemistry

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, DCL, Spring 2022

Job ID: 680-215136-1

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
TNTC	Too Numerous To Count

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Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, DCL, Spring 2022

Job ID: 680-215136-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-215136-1	LFM-99-05A-SPR22	Water	05/05/22 10:14	05/07/22 10:15
680-215136-2	DCL-DUP01-SPR22	Water	05/05/22 13:24	05/07/22 10:15

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Case Narrative

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, DCL, Spring 2022

Job ID: 680-215136-1

Job ID: 680-215136-1

Laboratory: Eurofins Savannah

Narrative

**Job Narrative
680-215136-1**

Comments

No additional comments.

Receipt

The samples were received on 5/7/2022 10:15 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice.

HPLC/IC

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA

Method 8081B 8082A: The closing continuing calibration verification (CCV) associated with batch 680-720533 recovered above the upper control limit for Endrin ketone and Toxaphene. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data has been reported. The associated samples are impacted: LFM-99-05A-SPR22 (680-215136-1), DCL-DUP01-SPR22 (680-215136-2) and (680-215078-A-2-A).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Subcontract Work

Methods MA EPH + PAHs, MA VPH + BTEX: These methods were subcontracted to Katahdin Analytical Services Inc. The subcontract laboratory certifications are different from that of the facility issuing the final report.

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens, DCL, Spring 2022

Job ID: 680-215136-1

Client Sample ID: LFM-99-05A-SPR22

Lab Sample ID: 680-215136-1

Date Collected: 05/05/22 10:14

Matrix: Water

Date Received: 05/07/22 10:15

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
4,4'-DDD	0.0078	U	0.026	0.0078	0.0033	ug/L		05/12/22 19:18	1
4,4'-DDE	0.0078	U M	0.026	0.0078	0.0027	ug/L		05/12/22 19:18	1
4,4'-DDT	0.0078	U	0.026	0.0078	0.0037	ug/L		05/12/22 19:18	1
Aldrin	0.0078	U	0.026	0.0078	0.0038	ug/L		05/12/22 19:18	1
alpha-BHC	0.0052	U	0.026	0.0052	0.0018	ug/L		05/12/22 19:18	1
beta-BHC	0.010	U	0.026	0.010	0.0048	ug/L		05/12/22 19:18	1
Chlordane (technical)	0.15	U M	0.26	0.15	0.050	ug/L		05/12/22 19:18	1
delta-BHC	0.010	U	0.026	0.010	0.0040	ug/L		05/12/22 19:18	1
Dieldrin	0.0052	U	0.026	0.0052	0.0020	ug/L		05/12/22 19:18	1
Endosulfan I	0.0052	U	0.026	0.0052	0.0019	ug/L		05/12/22 19:18	1
Endosulfan II	0.0052	U	0.026	0.0052	0.0022	ug/L		05/12/22 19:18	1
Endosulfan sulfate	0.0078	U	0.026	0.0078	0.0027	ug/L		05/12/22 19:18	1
Endrin	0.0078	U	0.026	0.0078	0.0028	ug/L		05/12/22 19:18	1
Endrin aldehyde	0.0078	U M	0.026	0.0078	0.0032	ug/L		05/12/22 19:18	1
Endrin ketone	0.0052	U M Q	0.026	0.0052	0.0024	ug/L		05/12/22 19:18	1
gamma-BHC (Lindane)	0.0052	U	0.026	0.0052	0.0019	ug/L		05/12/22 19:18	1
Heptachlor	0.0078	U	0.026	0.0078	0.0038	ug/L		05/12/22 19:18	1
Heptachlor epoxide	0.0052	U	0.026	0.0052	0.0020	ug/L		05/12/22 19:18	1
Methoxychlor	0.010	U M	0.026	0.010	0.0051	ug/L		05/12/22 19:18	1
Toxaphene	0.58	U Q	2.6	0.58	0.21	ug/L		05/12/22 19:18	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	44		14 - 130	05/11/22 18:35	05/12/22 19:18	1
Tetrachloro-m-xylene	55		44 - 124	05/11/22 18:35	05/12/22 19:18	1

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chloride	130		0.50	0.50	0.20	mg/L		05/18/22 20:26	1
Sulfate	15	M	1.0	1.0	0.40	mg/L		05/18/22 20:26	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	12	J	20	10	4.4	ug/L		05/11/22 19:36	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		05/11/22 19:36	1
Chromium	5.0	U	10	5.0	1.1	ug/L		05/11/22 19:36	1
Copper	10	U	20	10	3.2	ug/L		05/11/22 19:36	1
Iron	290		100	50	20	ug/L		05/11/22 19:36	1
Lead	10	U	40	10	6.6	ug/L		05/11/22 19:36	1
Manganese	9.3	J B	10	5.0	1.3	ug/L		05/11/22 19:36	1
Selenium	20	U	25	20	10	ug/L		05/11/22 19:36	1
Silver	5.0	U	10	5.0	1.5	ug/L		05/11/22 19:36	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	0.96	J	5.0	3.0	0.86	ug/L		05/10/22 16:27	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		05/11/22 12:15	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens, DCL, Spring 2022

Job ID: 680-215136-1

Client Sample ID: LFM-99-05A-SPR22

Lab Sample ID: 680-215136-1

Date Collected: 05/05/22 10:14

Matrix: Water

Date Received: 05/07/22 10:15

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity	97		5.0	5.0	5.0	mg/L		05/13/22 18:13	1
Nitrate/Nitrite-N	0.41		0.10	0.050	0.044	mg/L		05/11/22 17:53	1
Chemical Oxygen Demand	20	U	20	20	8.7	mg/L		05/17/22 11:46	1
Cyanide, Total	0.0054	J	0.010	0.0050	0.0025	mg/L		05/13/22 15:06	1
Total Dissolved Solids (TDS)	360		10	9.9	4.7	mg/L		05/12/22 10:10	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens, DCL, Spring 2022

Job ID: 680-215136-1

Client Sample ID: DCL-DUP01-SPR22

Lab Sample ID: 680-215136-2

Date Collected: 05/05/22 13:24

Matrix: Water

Date Received: 05/07/22 10:15

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
4,4'-DDD	0.0073	U M	0.024	0.0073	0.0031	ug/L		05/12/22 19:32	1
4,4'-DDE	0.0073	U	0.024	0.0073	0.0025	ug/L		05/12/22 19:32	1
4,4'-DDT	0.0073	U	0.024	0.0073	0.0034	ug/L		05/12/22 19:32	1
Aldrin	0.0073	U	0.024	0.0073	0.0035	ug/L		05/12/22 19:32	1
alpha-BHC	0.0048	U	0.024	0.0048	0.0016	ug/L		05/12/22 19:32	1
beta-BHC	0.0097	U	0.024	0.0097	0.0044	ug/L		05/12/22 19:32	1
Chlordane (technical)	0.14	U M	0.24	0.14	0.046	ug/L		05/12/22 19:32	1
delta-BHC	0.0097	U	0.024	0.0097	0.0037	ug/L		05/12/22 19:32	1
Dieldrin	0.0048	U	0.024	0.0048	0.0018	ug/L		05/12/22 19:32	1
Endosulfan I	0.0048	U	0.024	0.0048	0.0017	ug/L		05/12/22 19:32	1
Endosulfan II	0.0048	U	0.024	0.0048	0.0020	ug/L		05/12/22 19:32	1
Endosulfan sulfate	0.0073	U	0.024	0.0073	0.0025	ug/L		05/12/22 19:32	1
Endrin	0.0073	U	0.024	0.0073	0.0026	ug/L		05/12/22 19:32	1
Endrin aldehyde	0.0073	U M	0.024	0.0073	0.0030	ug/L		05/12/22 19:32	1
Endrin ketone	0.0048	U M Q	0.024	0.0048	0.0022	ug/L		05/12/22 19:32	1
gamma-BHC (Lindane)	0.0048	U	0.024	0.0048	0.0017	ug/L		05/12/22 19:32	1
Heptachlor	0.0073	U	0.024	0.0073	0.0035	ug/L		05/12/22 19:32	1
Heptachlor epoxide	0.0048	U	0.024	0.0048	0.0018	ug/L		05/12/22 19:32	1
Methoxychlor	0.0097	U	0.024	0.0097	0.0047	ug/L		05/12/22 19:32	1
Toxaphene	0.54	U Q	2.4	0.54	0.19	ug/L		05/12/22 19:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	38		14 - 130	05/11/22 18:35	05/12/22 19:32	1
Tetrachloro-m-xylene	49		44 - 124	05/11/22 18:35	05/12/22 19:32	1

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chloride	130		0.50	0.50	0.20	mg/L		05/18/22 20:39	1
Sulfate	15		1.0	1.0	0.40	mg/L		05/18/22 20:39	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	11	J	20	10	4.4	ug/L		05/11/22 19:38	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		05/11/22 19:38	1
Chromium	5.0	U	10	5.0	1.1	ug/L		05/11/22 19:38	1
Copper	10	U	20	10	3.2	ug/L		05/11/22 19:38	1
Iron	50	U	100	50	20	ug/L		05/11/22 19:38	1
Lead	10	U	40	10	6.6	ug/L		05/11/22 19:38	1
Manganese	5.0	U	10	5.0	1.3	ug/L		05/11/22 19:38	1
Selenium	20	U	25	20	10	ug/L		05/11/22 19:38	1
Silver	5.0	U	10	5.0	1.5	ug/L		05/11/22 19:38	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		05/10/22 16:30	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		05/11/22 12:17	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens, DCL, Spring 2022

Job ID: 680-215136-1

Client Sample ID: DCL-DUP01-SPR22

Lab Sample ID: 680-215136-2

Date Collected: 05/05/22 13:24

Matrix: Water

Date Received: 05/07/22 10:15

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity	95		5.0	5.0	5.0	mg/L		05/13/22 17:35	1
Nitrate/Nitrite-N	0.40		0.10	0.050	0.044	mg/L		05/11/22 17:55	1
Chemical Oxygen Demand	20	U	20	20	8.7	mg/L		05/17/22 11:46	1
Cyanide, Total	0.0053	J	0.010	0.0050	0.0025	mg/L		05/13/22 15:06	1
Total Dissolved Solids (TDS)	360		10	9.9	4.7	mg/L		05/12/22 10:10	1

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens, DCL, Spring 2022

Job ID: 680-215136-1

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Lab Sample ID: MB 680-720300/8-A
Matrix: Water
Analysis Batch: 720533

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 720300

Analyte	MB MB		LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
4,4'-DDD	0.0075	U	0.025	0.0075	0.0032	ug/L		05/12/22 17:38	1
4,4'-DDE	0.0075	U M	0.025	0.0075	0.0026	ug/L		05/12/22 17:38	1
4,4'-DDT	0.0075	U	0.025	0.0075	0.0035	ug/L		05/12/22 17:38	1
Aldrin	0.0075	U M	0.025	0.0075	0.0036	ug/L		05/12/22 17:38	1
alpha-BHC	0.0050	U	0.025	0.0050	0.0017	ug/L		05/12/22 17:38	1
beta-BHC	0.010	U	0.025	0.010	0.0046	ug/L		05/12/22 17:38	1
Chlordane (technical)	0.14	U M	0.25	0.14	0.048	ug/L		05/12/22 17:38	1
delta-BHC	0.010	U	0.025	0.010	0.0038	ug/L		05/12/22 17:38	1
Dieldrin	0.0050	U	0.025	0.0050	0.0019	ug/L		05/12/22 17:38	1
Endosulfan I	0.0050	U	0.025	0.0050	0.0018	ug/L		05/12/22 17:38	1
Endosulfan II	0.0050	U	0.025	0.0050	0.0021	ug/L		05/12/22 17:38	1
Endosulfan sulfate	0.0075	U	0.025	0.0075	0.0026	ug/L		05/12/22 17:38	1
Endrin	0.0075	U	0.025	0.0075	0.0027	ug/L		05/12/22 17:38	1
Endrin aldehyde	0.0075	U M	0.025	0.0075	0.0031	ug/L		05/12/22 17:38	1
Endrin ketone	0.0050	U M	0.025	0.0050	0.0023	ug/L		05/12/22 17:38	1
gamma-BHC (Lindane)	0.0050	U	0.025	0.0050	0.0018	ug/L		05/12/22 17:38	1
Heptachlor	0.0075	U	0.025	0.0075	0.0036	ug/L		05/12/22 17:38	1
Heptachlor epoxide	0.0050	U	0.025	0.0050	0.0019	ug/L		05/12/22 17:38	1
Methoxychlor	0.010	U	0.025	0.010	0.0049	ug/L		05/12/22 17:38	1
Toxaphene	0.56	U	2.5	0.56	0.20	ug/L		05/12/22 17:38	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
DCB Decachlorobiphenyl	96		14 - 130	05/11/22 18:35	05/12/22 17:38	1
Tetrachloro-m-xylene	57		44 - 124	05/11/22 18:35	05/12/22 17:38	1

Lab Sample ID: LCS 680-720300/9-A
Matrix: Water
Analysis Batch: 720533

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 720300

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
4,4'-DDE	0.0500	0.0367		ug/L		73	57 - 135
4,4'-DDT	0.0500	0.0467		ug/L		93	51 - 143
Aldrin	0.0500	0.0275		ug/L		55	45 - 134
alpha-BHC	0.0500	0.0372		ug/L		74	54 - 138
beta-BHC	0.0500	0.0392		ug/L		78	56 - 136
delta-BHC	0.0500	0.0438		ug/L		88	52 - 142
Dieldrin	0.0500	0.0445		ug/L		89	60 - 136
Endosulfan I	0.0500	0.0437		ug/L		87	62 - 126
Endosulfan II	0.0500	0.0448		ug/L		90	52 - 135
Endosulfan sulfate	0.0500	0.0502		ug/L		100	62 - 133
Endrin	0.0500	0.0454		ug/L		91	60 - 138
Endrin aldehyde	0.0500	0.0498		ug/L		100	51 - 132
Endrin ketone	0.0500	0.0523		ug/L		105	58 - 134
gamma-BHC (Lindane)	0.0500	0.0376		ug/L		75	59 - 134
Heptachlor	0.0500	0.0300		ug/L		60	54 - 130
Heptachlor epoxide	0.0500	0.0406		ug/L		81	61 - 133
Methoxychlor	0.0500	0.0509		ug/L		102	54 - 145

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens, DCL, Spring 2022

Job ID: 680-215136-1

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC) (Continued)

Lab Sample ID: LCS 680-720300/9-A
 Matrix: Water
 Analysis Batch: 720533

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 720300

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
DCB Decachlorobiphenyl	81		14 - 130
Tetrachloro-m-xylene	56		44 - 124

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 680-721378/45
 Matrix: Water
 Analysis Batch: 721378

Client Sample ID: Method Blank
 Prep Type: Total/NA

Analyte	MB MB		LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Chloride	0.50	U	0.50	0.50	0.20	mg/L		05/18/22 17:38	1
Sulfate	1.0	U	1.0	1.0	0.40	mg/L		05/18/22 17:38	1

Lab Sample ID: LCS 680-721378/46
 Matrix: Water
 Analysis Batch: 721378

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Chloride	10.0	10.1		mg/L		101	87 - 111
Sulfate	10.0	9.11		mg/L		91	87 - 112

Lab Sample ID: LCSD 680-721378/47
 Matrix: Water
 Analysis Batch: 721378

Client Sample ID: Lab Control Sample Dup
 Prep Type: Total/NA

Analyte	Spike Added	LCSD LCSD		Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
		Result	Qualifier						
Chloride	10.0	10.1		mg/L		101	87 - 111	0	15
Sulfate	10.0	9.14		mg/L		91	87 - 112	0	15

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-720085/1-A
 Matrix: Water
 Analysis Batch: 720554

Client Sample ID: Method Blank
 Prep Type: Total Recoverable
 Prep Batch: 720085

Analyte	MB MB		LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Barium	10	U	20	10	4.4	ug/L		05/11/22 18:40	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		05/11/22 18:40	1
Chromium	5.0	U	10	5.0	1.1	ug/L		05/11/22 18:40	1
Copper	10	U	20	10	3.2	ug/L		05/11/22 18:40	1
Iron	50	U	100	50	20	ug/L		05/11/22 18:40	1
Lead	10	U	40	10	6.6	ug/L		05/11/22 18:40	1
Manganese	7.31	J	10	5.0	1.3	ug/L		05/11/22 18:40	1
Selenium	20	U	25	20	10	ug/L		05/11/22 18:40	1
Silver	5.0	U	10	5.0	1.5	ug/L		05/11/22 18:40	1

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens, DCL, Spring 2022

Job ID: 680-215136-1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LCS 680-720085/2-A
 Matrix: Water
 Analysis Batch: 720554

Client Sample ID: Lab Control Sample
 Prep Type: Total Recoverable
 Prep Batch: 720085

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec	
							Limits	
Barium	100	95.0		ug/L		95	88 - 113	
Cadmium	50.0	45.3		ug/L		91	88 - 113	
Chromium	100	92.7		ug/L		93	90 - 113	
Copper	99.1	97.3		ug/L		98	86 - 114	
Iron	5000	4600		ug/L		92	87 - 115	
Lead	505	449		ug/L		89	86 - 113	
Manganese	400	368		ug/L		92	90 - 114	
Selenium	100	88.4		ug/L		88	83 - 114	
Silver	50.0	47.0		ug/L		94	84 - 115	

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 680-719924/1-A
 Matrix: Water
 Analysis Batch: 720193

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 719924

Analyte	MB MB		LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		05/10/22 15:25	1

Lab Sample ID: LCS 680-719924/2-A
 Matrix: Water
 Analysis Batch: 720193

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 719924

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec	
							Limits	
Arsenic	100	98.8		ug/L		99	84 - 116	

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 680-720105/12-A
 Matrix: Water
 Analysis Batch: 720363

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 720105

Analyte	MB MB		LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Mercury	0.20	U	0.25	0.20	0.080	ug/L		05/11/22 11:11	1

Lab Sample ID: LCS 680-720105/13-A
 Matrix: Water
 Analysis Batch: 720363

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 720105

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec	
							Limits	
Mercury	2.50	2.50		ug/L		100	80 - 124	

Method: 2320B-2011 - Alkalinity, Total

Lab Sample ID: MB 680-720904/5
 Matrix: Water
 Analysis Batch: 720904

Client Sample ID: Method Blank
 Prep Type: Total/NA

Analyte	MB MB		LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Alkalinity	5.0	U	5.0	5.0	5.0	mg/L		05/13/22 16:26	1

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens, DCL, Spring 2022

Job ID: 680-215136-1

Method: 2320B-2011 - Alkalinity, Total (Continued)

Lab Sample ID: LCS 680-720904/7
 Matrix: Water
 Analysis Batch: 720904

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Alkalinity	250	236		mg/L		95	90 - 112

Lab Sample ID: LCSD 680-720904/32
 Matrix: Water
 Analysis Batch: 720904

Client Sample ID: Lab Control Sample Dup
 Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Alkalinity	250	242		mg/L		97	90 - 112	2	30

Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 280-574653/62
 Matrix: Water
 Analysis Batch: 574653

Client Sample ID: Method Blank
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Nitrate/Nitrite-N	0.050	U	0.10	0.050	0.044	mg/L		05/11/22 17:21	1

Lab Sample ID: LCS 280-574653/60
 Matrix: Water
 Analysis Batch: 574653

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate/Nitrite-N	5.00	4.95		mg/L		99	90 - 110

Lab Sample ID: LCSD 280-574653/61
 Matrix: Water
 Analysis Batch: 574653

Client Sample ID: Lab Control Sample Dup
 Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Nitrate/Nitrite-N	5.00	5.08		mg/L		102	90 - 110	2	10

Method: 410.4 - COD

Lab Sample ID: MB 280-575212/5
 Matrix: Water
 Analysis Batch: 575212

Client Sample ID: Method Blank
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chemical Oxygen Demand	20	U	20	20	8.7	mg/L		05/17/22 11:46	1

Lab Sample ID: LCS 280-575212/3
 Matrix: Water
 Analysis Batch: 575212

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chemical Oxygen Demand	100	98.9		mg/L		99	90 - 110

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens, DCL, Spring 2022

Job ID: 680-215136-1

Method: 410.4 - COD (Continued)

Lab Sample ID: LCSD 280-575212/4
 Matrix: Water
 Analysis Batch: 575212

Client Sample ID: Lab Control Sample Dup
 Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chemical Oxygen Demand	100	91.5		mg/L		92	90 - 110	8	11

Method: 9012B - Cyanide, Total and/or Amenable

Lab Sample ID: MB 680-720618/12-A
 Matrix: Water
 Analysis Batch: 720816

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 720618

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Cyanide, Total	0.0050	U	0.010	0.0050	0.0025	mg/L		05/13/22 14:59	1

Lab Sample ID: LCS 680-720618/13-A
 Matrix: Water
 Analysis Batch: 720816

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 720618

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	0.0500	0.0526		mg/L		105	83 - 116

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 280-574704/1
 Matrix: Water
 Analysis Batch: 574704

Client Sample ID: Method Blank
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	9.9	U	10	9.9	4.7	mg/L		05/12/22 10:10	1

Lab Sample ID: LCS 280-574704/2
 Matrix: Water
 Analysis Batch: 574704

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids (TDS)	504	491		mg/L		97	88 - 114

QC Association Summary

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens, DCL, Spring 2022

Job ID: 680-215136-1

GC Semi VOA

Prep Batch: 720300

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215136-1	LFM-99-05A-SPR22	Total/NA	Water	3520C	
680-215136-2	DCL-DUP01-SPR22	Total/NA	Water	3520C	
MB 680-720300/8-A	Method Blank	Total/NA	Water	3520C	
LCS 680-720300/9-A	Lab Control Sample	Total/NA	Water	3520C	

Analysis Batch: 720533

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215136-1	LFM-99-05A-SPR22	Total/NA	Water	8081B 8082A	720300
680-215136-2	DCL-DUP01-SPR22	Total/NA	Water	8081B 8082A	720300
MB 680-720300/8-A	Method Blank	Total/NA	Water	8081B 8082A	720300
LCS 680-720300/9-A	Lab Control Sample	Total/NA	Water	8081B 8082A	720300

HPLC/IC

Analysis Batch: 721378

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215136-1	LFM-99-05A-SPR22	Total/NA	Water	9056A	
680-215136-2	DCL-DUP01-SPR22	Total/NA	Water	9056A	
MB 680-721378/45	Method Blank	Total/NA	Water	9056A	
LCS 680-721378/46	Lab Control Sample	Total/NA	Water	9056A	
LCSD 680-721378/47	Lab Control Sample Dup	Total/NA	Water	9056A	

Metals

Prep Batch: 719924

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215136-1	LFM-99-05A-SPR22	Total/NA	Water	3010A	
680-215136-2	DCL-DUP01-SPR22	Total/NA	Water	3010A	
MB 680-719924/1-A	Method Blank	Total/NA	Water	3010A	
LCS 680-719924/2-A	Lab Control Sample	Total/NA	Water	3010A	

Prep Batch: 720085

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215136-1	LFM-99-05A-SPR22	Total Recoverable	Water	3005A	
680-215136-2	DCL-DUP01-SPR22	Total Recoverable	Water	3005A	
MB 680-720085/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-720085/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 720105

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215136-1	LFM-99-05A-SPR22	Total/NA	Water	7470A	
680-215136-2	DCL-DUP01-SPR22	Total/NA	Water	7470A	
MB 680-720105/12-A	Method Blank	Total/NA	Water	7470A	
LCS 680-720105/13-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 720193

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215136-1	LFM-99-05A-SPR22	Total/NA	Water	6020A	719924
680-215136-2	DCL-DUP01-SPR22	Total/NA	Water	6020A	719924
MB 680-719924/1-A	Method Blank	Total/NA	Water	6020A	719924
LCS 680-719924/2-A	Lab Control Sample	Total/NA	Water	6020A	719924

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QC Association Summary

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens, DCL, Spring 2022

Job ID: 680-215136-1

Metals

Analysis Batch: 720363

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215136-1	LFM-99-05A-SPR22	Total/NA	Water	7470A	720105
680-215136-2	DCL-DUP01-SPR22	Total/NA	Water	7470A	720105
MB 680-720105/12-A	Method Blank	Total/NA	Water	7470A	720105
LCS 680-720105/13-A	Lab Control Sample	Total/NA	Water	7470A	720105

Analysis Batch: 720554

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215136-1	LFM-99-05A-SPR22	Total Recoverable	Water	6010C	720085
680-215136-2	DCL-DUP01-SPR22	Total Recoverable	Water	6010C	720085
MB 680-720085/1-A	Method Blank	Total Recoverable	Water	6010C	720085
LCS 680-720085/2-A	Lab Control Sample	Total Recoverable	Water	6010C	720085

General Chemistry

Analysis Batch: 574653

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215136-1	LFM-99-05A-SPR22	Total/NA	Water	353.2	
680-215136-2	DCL-DUP01-SPR22	Total/NA	Water	353.2	
MB 280-574653/62	Method Blank	Total/NA	Water	353.2	
LCS 280-574653/60	Lab Control Sample	Total/NA	Water	353.2	
LCSD 280-574653/61	Lab Control Sample Dup	Total/NA	Water	353.2	

Analysis Batch: 574704

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215136-1	LFM-99-05A-SPR22	Total/NA	Water	SM 2540C	
680-215136-2	DCL-DUP01-SPR22	Total/NA	Water	SM 2540C	
MB 280-574704/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-574704/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 575212

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215136-1	LFM-99-05A-SPR22	Total/NA	Water	410.4	
680-215136-2	DCL-DUP01-SPR22	Total/NA	Water	410.4	
MB 280-575212/5	Method Blank	Total/NA	Water	410.4	
LCS 280-575212/3	Lab Control Sample	Total/NA	Water	410.4	
LCSD 280-575212/4	Lab Control Sample Dup	Total/NA	Water	410.4	

Prep Batch: 720618

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215136-1	LFM-99-05A-SPR22	Total/NA	Water	9012B	
680-215136-2	DCL-DUP01-SPR22	Total/NA	Water	9012B	
MB 680-720618/12-A	Method Blank	Total/NA	Water	9012B	
LCS 680-720618/13-A	Lab Control Sample	Total/NA	Water	9012B	

Analysis Batch: 720816

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215136-1	LFM-99-05A-SPR22	Total/NA	Water	9012B	720618
680-215136-2	DCL-DUP01-SPR22	Total/NA	Water	9012B	720618
MB 680-720618/12-A	Method Blank	Total/NA	Water	9012B	720618
LCS 680-720618/13-A	Lab Control Sample	Total/NA	Water	9012B	720618

QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, DCL, Spring 2022

Job ID: 680-215136-1

General Chemistry

Analysis Batch: 720904

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215136-1	LFM-99-05A-SPR22	Total/NA	Water	2320B-2011	
680-215136-2	DCL-DUP01-SPR22	Total/NA	Water	2320B-2011	
MB 680-720904/5	Method Blank	Total/NA	Water	2320B-2011	
LCS 680-720904/7	Lab Control Sample	Total/NA	Water	2320B-2011	
LCSD 680-720904/32	Lab Control Sample Dup	Total/NA	Water	2320B-2011	

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Lab Chronicle

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens, DCL, Spring 2022

Job ID: 680-215136-1

Client Sample ID: LFM-99-05A-SPR22

Lab Sample ID: 680-215136-1

Date Collected: 05/05/22 10:14

Matrix: Water

Date Received: 05/07/22 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			957.8 mL	5 mL	720300	05/11/22 18:35	IR	TAL SAV
Total/NA	Analysis	8081B 8082A		1			720533	05/12/22 19:18	JCK	TAL SAV
Instrument ID: CSGAA										
Total/NA	Analysis	9056A		1	5 mL	5 mL	721378	05/18/22 20:26	UI	TAL SAV
Instrument ID: CICH										
Total Recoverable	Prep	3005A			50 mL	50 mL	720085	05/10/22 11:26	JE	TAL SAV
Total Recoverable	Analysis	6010C		1			720554	05/11/22 19:36	BCB	TAL SAV
Instrument ID: ICPH										
Total/NA	Prep	3010A			50 mL	250 mL	719924	05/09/22 16:31	JE	TAL SAV
Total/NA	Analysis	6020A		1			720193	05/10/22 16:27	BWR	TAL SAV
Instrument ID: ICPMSD										
Total/NA	Prep	7470A			50 mL	50 mL	720105	05/10/22 13:23	JKL	TAL SAV
Total/NA	Analysis	7470A		1			720363	05/11/22 12:15	JKL	TAL SAV
Instrument ID: QuickTrace2										
Total/NA	Analysis	2320B-2011		1			720904	05/13/22 18:13	DR	TAL SAV
Instrument ID: MANTECH 2										
Total/NA	Analysis	353.2		1	100 mL	100 mL	574653	05/11/22 17:53	SVC	TAL DEN
Instrument ID: WC_Alph 2										
Total/NA	Analysis	410.4		1	2 mL	2 mL	575212	05/17/22 11:46	SJD	TAL DEN
Instrument ID: WC_Genesys20										
Total/NA	Prep	9012B			6 mL	6 mL	720618	05/13/22 08:59	NVF	TAL SAV
Total/NA	Analysis	9012B		1			720816	05/13/22 15:06	NVF	TAL SAV
Instrument ID: KONELAB4										
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	574704	05/12/22 10:10	CAI	TAL DEN
Instrument ID: NoEquip										

Client Sample ID: DCL-DUP01-SPR22

Lab Sample ID: 680-215136-2

Date Collected: 05/05/22 13:24

Matrix: Water

Date Received: 05/07/22 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1034 mL	5 mL	720300	05/11/22 18:35	IR	TAL SAV
Total/NA	Analysis	8081B 8082A		1			720533	05/12/22 19:32	JCK	TAL SAV
Instrument ID: CSGAA										
Total/NA	Analysis	9056A		1	5 mL	5 mL	721378	05/18/22 20:39	UI	TAL SAV
Instrument ID: CICH										
Total Recoverable	Prep	3005A			50 mL	50 mL	720085	05/10/22 11:26	JE	TAL SAV
Total Recoverable	Analysis	6010C		1			720554	05/11/22 19:38	BCB	TAL SAV
Instrument ID: ICPH										
Total/NA	Prep	3010A			50 mL	250 mL	719924	05/09/22 16:31	JE	TAL SAV
Total/NA	Analysis	6020A		1			720193	05/10/22 16:30	BWR	TAL SAV
Instrument ID: ICPMSD										
Total/NA	Prep	7470A			50 mL	50 mL	720105	05/10/22 13:23	JKL	TAL SAV
Total/NA	Analysis	7470A		1			720363	05/11/22 12:17	JKL	TAL SAV
Instrument ID: QuickTrace2										

Eurofins Savannah

Lab Chronicle

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens, DCL, Spring 2022

Job ID: 680-215136-1

Client Sample ID: DCL-DUP01-SPR22

Lab Sample ID: 680-215136-2

Date Collected: 05/05/22 13:24

Matrix: Water

Date Received: 05/07/22 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2320B-2011		1			720904	05/13/22 17:35	DR	TAL SAV
Total/NA	Analysis	353.2		1	100 mL	100 mL	574653	05/11/22 17:55	SVC	TAL DEN
		Instrument ID: WC_Alp 2								
Total/NA	Analysis	410.4		1	2 mL	2 mL	575212	05/17/22 11:46	SJD	TAL DEN
		Instrument ID: WC_Genesys20								
Total/NA	Prep	9012B			6 mL	6 mL	720618	05/13/22 08:59	NVF	TAL SAV
Total/NA	Analysis	9012B		1			720816	05/13/22 15:06	NVF	TAL SAV
		Instrument ID: KONELAB4								
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	574704	05/12/22 10:10	CAI	TAL DEN
		Instrument ID: NoEquip								

Laboratory References:

- = Katahdin Analytical Services Inc, 600 Technology Way, Scarborough, ME 04074
- TAL DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100
- TAL SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858



Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens, DCL, Spring 2022

Job ID: 680-215136-1

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	09-18-22

Laboratory: Eurofins Denver

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	2907.01	10-31-23

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Method Summary

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens, DCL, Spring 2022

Job ID: 680-215136-1

Method	Method Description	Protocol	Laboratory
8081B 8082A	Organochlorine Pesticides & PCBs (GC)	SW846	TAL SAV
9056A	Anions, Ion Chromatography	SW846	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV
6020A	Metals (ICP/MS)	SW846	TAL SAV
7470A	Mercury (CVAA)	SW846	TAL SAV
2320B-2011	Alkalinity, Total	SM	TAL SAV
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	TAL DEN
410.4	COD	MCAWW	TAL DEN
9012B	Cyanide, Total and/or Amenable	EPA	TAL SAV
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL DEN
MA-EPH	MADEP EPH (Extractable Petroleum Hydroca	MA DEP	
MA-VPH	MADEP VPH Volatile Petroleum Hydrocarbon	MA DEP	
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL SAV
3010A	Preparation, Total Metals	SW846	TAL SAV
3520C	Liquid-Liquid Extraction (Continuous)	SW846	TAL SAV
7470A	Preparation, Mercury	SW846	TAL SAV
9012B	Cyanide, Total and/or Amenable, Distillation	SW846	TAL SAV

Protocol References:

- EPA = US Environmental Protection Agency
- MA DEP = Massachusetts Department Of Environmental Protection
- MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
- SM = "Standard Methods For The Examination Of Water And Wastewater"
- SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

- = Katahdin Analytical Services Inc, 600 Technology Way, Scarborough, ME 04074
- TAL DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100
- TAL SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858



MassDEP Analytical Protocol Certification Form

Laboratory Name: Katahdin Analytical Services, LLC.

Project #:

Project Location: Fort Devens

RTN:

This Form provides certifications for the following data set: list Laboratory Sample ID Number(s):
SP2191-1, 2

Matrices: Groundwater/Surface Water • Soil/Sediment • Drinking Water • Air • Other: _____

CAM Protocol (check all that apply below):

8260 VOC CAM II A •	7470/7471 Hg CAM III B •	MassDEP VPH CAM IV A <input checked="" type="checkbox"/>	8081 Pesticides CAM V B •	7196 Hex Cr CAM VI B •	MassDEP APH CAM IX A •
8270 SVOC CAM II B •	7010 Metals CAM III C •	MassDEP EPH CAM IV B <input checked="" type="checkbox"/>	8151 Herbicides CAM V C •	8330 Explosives CAM VIII A •	TO-15 VOC CAM IX B •
6010 Metals CAM III A •	6020 Metals CAM III D •	8082 PCB CAM V A •	9014 Total Cyanide/PAC CAM VI A •	6860 Perchlorate CAM VIII B •	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	X Yes • No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	X Yes • No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	X Yes • No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	X Yes • No
E	VPH, EPH, APH, and TO-15 only: a. VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	X Yes • No X Yes • No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	X Yes X No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	X Yes • No ¹
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Data User Note: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.

H	Were all QC performance standards specified in the CAM protocol(s) achieved?	X Yes • No ¹
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	X Yes • No ¹

¹All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: _____

Position: Q.A. Officer

Printed Name: Leslie Dimond

Date: 06/10/2022



TEST AMERICA SAVANNAH

FORT DEVENS - DCL, SPRING, 2022

SP2191

Ms. Leslie Dimond
207-874-2400

KATAHDIN ANALYTICAL SERVICES
600 TECHNOLOGY WAY
SCARBOROUGH, ME 04074

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SAMPLE DATA PACKAGE

NARRATIVE
KATAHDIN ANALYTICAL SERVICES
TEST AMERICA SAVANNAH
FORT DEVENS – DCL, SPRING, 2022
SP2191

Sample Receipt

The following samples were received on May 10, 2022 and were logged in under Katahdin Analytical Services work order number SP2191 for a hardcopy due date of May 31, 2022.

<u>Sample No.</u>	<u>Sample Identification</u>
KATAHDIN SP2191-1	TEST AMERICA SAVANNAH LFM-99-05A-SPR22
SP2191-2	DCL-DUP01-SPR22

The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

We certify that the test results provided in this report meet all the requirements of the NELAP standards unless otherwise noted in this narrative or in the Report of Analysis.

We certify that the test results provided in this report are accredited under the laboratory's ISO/IEC 17025:2017 and DoD-ELAP accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation L2223.

Analytes which are reported but not listed on our ANAB scope of accreditation will be “^” flagged and the following language will be included in the case narrative for all DoD compliant work: “^” Indicates this analyte is not included on Katahdin Analytical Services DoD-ELAP Scope of Accreditation.

Sample analyses have been performed by the methods as noted herein.

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact your Katahdin Analytical Services Project Manager, **Ms. Heather Manz**. This narrative is an integral part of the Report of Analysis.

Organics Analysis

The samples of Work Order SP2191 was analyzed in accordance with Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Third Edition, Final Updates I (1993), II (1995), IIA (1994), IIB (1995), III (1997), IIIA (1999), IIIB (2005), IV (2008), and V (2015), and/or for the specific methods listed below or on the Report of Analysis.

VPH Analysis

There were no protocol deviations or observations noted by the organics laboratory staff.

EPH Analysis

Samples SP2191-1 and 2 had low recoveries for the extraction surrogates 5-alpha androstane that were outside of the method acceptance limits. The client was contacted and informed the laboratory to reextract the samples. Sample SP2191-1 was reextracted seven days out of hold time, and the results from both extractions are reported. Sample SP2191-2 was not reextracted because there was no additional aliquot.

Due to a laboratory error, the LCSD WG318022-3 was not spiked with the extraction surrogates o-terphenyl and 5-alpha androstane. Since the spike recoveries were acceptable, no further action was taken.

The method blank WG318787-1 and the LCS/LCSD WG318787-2 and 3 had low recoveries for the extraction surrogates o-terphenyl that were outside of the method acceptance limits. Since this is associated with the reextracted sample SP2191-1, no further action was taken.

The closing CV (File CPE10180) had high responses for five target analytes that resulted in %D's that exceeded the method acceptance limits of $\pm 25\%$. Since the opening CV was acceptable and a high response would indicate a high bias and no target analytes were detected above the MDL in the associated samples, no further action was taken.

The opening CV (File CPF20004) had a low response for the C36 hydrocarbon that resulted in a %D that exceeded the method acceptance limits of $\pm 25\%$. Since the C19-C36 range was acceptable, no further action was taken.

The closing CV (File CPF10026) had high responses for two target analytes that resulted in %D's that exceeded the method acceptance limits of $\pm 25\%$. This is acceptable according to the method for allowing up to four analytes with responses resulting in %D's greater than 25% but less than 40%.

There were no other protocol deviations or observations noted by the organics laboratory staff.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized the Quality Assurance Officer, or their designee, as verified by the following signature.

Leslie Dimond
Quality Assurance Officer

Katahdin Analytical Services, Inc.

Manual Integration Codes For GC/MS, GC, HPLC and/or IC

M1	Peak splitting.
M2	Well defined peaks on the shoulders of the other peaks.
M3	There is additional area due to a coeluting interferant.
M4	There are negative spikes in the baseline.
M5	There are rising or falling baselines.
M6	The software has failed to detect a peak or misidentified a peak.
M7	Excessive peak tailing.
M8	Analysis such as GRO, DRO and TPH require a baseline hold.
M9	Peak was not completely integrated as in GC/MS.
M10	Primary ion was correctly integrated, but secondary or tertiary ion needed manual integration as in GC/MS.
M11	For GC analysis, when a sample is diluted by 1:10 or more, the surrogate is set to undetected and then the area under the surrogate is manually integrated.
M12	Manual integration saved in method due to TurboChrom floating point error.

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Katahdin Analytical Services, LLC.

Sample Receipt Condition Report

Client: <i>Eurofins</i>	KAS PM: <i>HHM</i>	Sampled By: <i>Chant</i>
Project:	KIMS Entry By: <i>GN</i>	Delivered By: <i>FedEx</i>
KAS Work Order#: <i>SP2191</i>	KIMS Review By: <i>HHM</i>	Received By: <i>GN</i>
	Labeled By: <i>GN</i>	
SDG #:	Cooler: <u>1</u> of <u>2</u>	Date/Time Rec.: <i>5-10-22/12:10</i>

Receipt Criteria	Y	N	EX*	NA	Comments and/or Resolution
1. Custody seals present / intact?		/			
2. Chain of Custody present in cooler?	✓				
3. Chain of Custody signed by client?	✓				
4. Chain of Custody matches samples?					
5. Temperature Blanks present? If not, take temperature of any sample w/ IR gun.		✓			Temp (°C): <i>5.8</i> Thermometer ID: IR-1
Samples received at <6 °C w/o freezing?	✓				Note: Not required for metals (except Hg soil) analysis.
Ice packs or ice present?	✓				The lack of ice or ice packs (i.e. no attempt to begin cooling process) or insufficient ice may not meet certain regulatory requirements and may invalidate certain data.
If yes, was there sufficient ice to meet temperature requirements?	✓				
If temp. out, has the cooling process begun (i.e. ice or packs present) and sample collection times <6hrs., but samples are not yet cool?				✓	Note: No cooling process required for metals (except Hg soil) analysis.
6. Volatiles: Aqueous: No bubble larger than a pea?	✓				
Soil/Sediment:					
Received in airtight container?				/	
Received in methanol?				/	
Methanol covering soil?				/	
D.I. Water - Received within 48 hour HT?				/	
7. Trip Blank present in cooler?		/			
8. Proper sample containers and volume?	/				
9. Samples within hold time upon receipt?	/				
10. Aqueous samples properly preserved? Metals, COD, NH3, TKN, O/G, phenol, TPO4, N+N, TOC, DRO, TPH – pH <2 Sulfide - >9 Cyanide – pH >12		/		/	
11. Bottleware Prepped on:					
* Log-In Notes to Exceptions: document any problems with samples or discrepancies or pH adjustments.					

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Katahdin Analytical Services, LLC.

Sample Receipt Condition Report

Client: <i>Eurofins</i>	KAS PM: <i>HHM</i>	Sampled By: <i>Chut</i>
Project:	KIMS Entry By: <i>GN</i>	Delivered By: <i>FedEx</i>
KAS Work Order#: <i>SP2191</i>	KIMS Review By: <i>HHM</i>	Received By: <i>GN</i>
	Labeled By: <i>GN</i>	
SDG #:	Cooler: <u>2</u> of <u>2</u>	Date/Time Rec.: <i>5-10-22/12:10</i>

Receipt Criteria	Y	N	EX*	NA	Comments and/or Resolution
1. Custody seals present / intact?		/			
2. Chain of Custody present in cooler?	/				
3. Chain of Custody signed by client?	/				
4. Chain of Custody matches samples?					
5. Temperature Blanks present? If not, take temperature of any sample w/ IR gun.		/			Temp (°C): <i>5.4</i> Thermometer ID: IR-1
Samples received at <6 °C w/o freezing?	/				Note: Not required for metals (except Hg soil) analysis.
Ice packs or ice present?	/				The lack of ice or ice packs (i.e. no attempt to begin cooling process) or insufficient ice may not meet certain regulatory requirements and may invalidate certain data.
If yes, was there sufficient ice to meet temperature requirements?	/				
If temp. out, has the cooling process begun (i.e. ice or packs present) and sample collection times <6hrs., but samples are not yet cool?				/	Note: No cooling process required for metals (except Hg soil) analysis.
6. Volatiles: Aqueous: No bubble larger than a pea? Soil/Sediment: Received in airtight container? Received in methanol? Methanol covering soil?	/			/	<i>headspace in vials -1</i>
D.I. Water - Received within 48 hour HT?	/			/	
7. Trip Blank present in cooler?		/			
8. Proper sample containers and volume?	/				
9. Samples within hold time upon receipt?	/				
10. Aqueous samples properly preserved? Metals, COD, NH3, TKN, O/G, phenol, TPO4, N+N, TOC, DRO, TPH - pH <2 Sulfide - >9 Cyanide - pH >12	/	/		/	<i>EPH preserved @ logen w/ HCL MR3198</i>

11. Bottleneck Prepped on:

* Log-In Notes to Exceptions: document any problems with samples or discrepancies or pH adjustments.

1 Amber Dup arrived broken

SP2191

Chain of Custody Record



Client Information (Sub Contract Lab)		Lab P/M: Lanier, Jerry A		Carrier Tracking No(s): 680-693409.1	
Shipping/Receiving		E-Mail: Jerry.Lanier@et.eurofinsus.com		Page: Page 1 of 1	
Company: Katahdin Analytical Services		Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB		Job #: 680-215136-1	
Address: 600 Technology Way, Scarborough, ME, 04074		Due Date Requested: 5/18/2022		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:	
PO #: _____		TAT Requested (days): _____		M - Hexane N - None O - AsNaO2 P - Na2OAS Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4.5 Z - other (specify)	
WO #: _____		Field Filtered Sample (Yes or No) <input checked="" type="checkbox"/>		Total Number of Containers: 2	
Project #: 68023801		Form MS/MSD (Yes or No) <input checked="" type="checkbox"/>		Special Instructions/Note:	
Site: _____		SUB (MA VPH + BTEX)/ MA VPH			
		SUB (MA EPH + PAHs)/ MA EPH			
		Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)			
		Sample Type (C=comp, G=grab)			
		Sample Time			
		Sample Date			
		Preservation Code			
Sample Identification - Client ID (Lab ID)		5/5/22		Water	
LFM-99-05A-SPR22 (680-215136-1)		10:14 Eastern		Water	
DCL-DUP01-SPR22 (680-215136-2)		13:24 Eastern			
<p>Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing Southeast, LLC places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Southeast, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Southeast, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Southeast, LLC.</p>					
<p>Possible Hazard Identification</p> <p>Unconfirmed <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months</p> <p>Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2</p> <p>Empty Kit Relinquished by: _____ Date: _____ Method of Shipment: _____</p> <p>Relinquished by: _____ Date/Time: 5/4/22 11:05 Company: KAS</p> <p>Relinquished by: _____ Date/Time: _____ Company: _____</p> <p>Relinquished by: _____ Date/Time: _____ Company: _____</p> <p>Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No Custody Seal No.: _____ Cooler Temperature(s) °C and Other Remarks: _____</p>					



ICOC No:
680-693429

Containers

<u>Count</u>	<u>Container Type</u>
6	Voa Vial 40ml - Hydrochloric Acid

<u>Preservative</u>
Hydrochloric Acid

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

ICOC No:
680-693409

Containers

<u>Count</u>	<u>Container Type</u>	<u>Preservative</u>
4	Amber Glass 1 liter - unpreserved	None

- 1
- 2
- 3
- 4
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Please notify your PM immediately if an error is found in shipment. When returning samples, please return all provided QC samples.

Shipping Order ID: 135886

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Printed on 5/9/2022 10:37:48AM

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Bottle Order Information

Bottle Order:
Bottle Order #: Request From Client: 5/9/2022
Date Order Posted: Order Status: Ready To Process
Prepared By: **Deliver By Date: 5/9/2022 11:59:00PM**
Lab Project Number: PWSID:

Order Completion Information

Creator: Tyler Hartley
Filled by:
Sent Date:
Sent Via:
Tracking #:

Sets	Bottles/Set	Qty	Bottle Type Description	Preservative	Method	Matrix	Sample Type	Comments	Lot #
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Notes to Field Staff:



Scan QR code for field sampler instructions

Health and Safety Notes:

Preservative Comment

Relinquished By	Company	Date	Time	Received By	Company	Seal #:
Relinquished By	Company	Date	Time	Received By	Company	Seal #:

Please notify your PM immediately if an error is found in shipment. When returning samples, please return all provided QC samples.



Login Number: SP2191

Account: TASAV001
Test America Savannah
Project: TASAV-DEVENS

Primary Report Address:

Jerry Lanier
Test America Savannah
5102 LaRoche Avenue

Savannah, GA 31404

Jerry.Lanier@testamericainc.com

Primary Invoice Address:

Accounts Payable
Test America Savannah
5102 LaRoche Avenue

Savannah, GA 31404

email project manager

Report CC Addresses:

Invoice CC Addresses:

Quote/Incoming: TASAV-DEVENS

Login Information

ANALYSIS INSTRUCTIONS : FDS, DOD QSM 5.3 reporting with DOD limits. ND to LOD. "J" flag between MDL and PQL. Need LCS/LCSD. Follow MA MCP CAM. Include level 4 narrative.

CHECK NO. :

CLIENT PO# : 68023801

CLIENT PROJECT MANAGE : Jerry Lanier

CONTRACT : 680-215136

COOLER TEMPERATURE : 5.8, 5.4

DELIVERY SERVICES : Fedex

EDD FORMAT : ECC-091317-TXT

ISM INSTRUCTIONS :

LOGIN INITIALS : GN

PM : HHM

PROJECT NAME : Fort Devens - DCL, Spring, 2022

QC LEVEL : IV

REPORT INSTRUCTIONS : SDS needs all forms. Include Level 4 narrative and MCP forms (from Leslie). Send level 4 PDF & level 2 PDF. Level 2= SDP & SDS. Upload EDD to Ft. Devens Database. Email PDF, EDD, and invoice to Beth.Daughtry@Eurofinset.com & Jerry.Lanier@et.eurofinsus.com. No HC.

SDG ID :

SDG STATUS :

VERBAL TAT :

Login Number: SP2191
Account: TASAV001

Test America Savannah

Project: TASAV-DEVENS

Quote/Incoming: TASAV-DEVENS

Laboratory Sample ID	Client Sample Number	Collect Date/Time	Receive Date	PR	Due Date	Verbal Due Date	Mailed
SP2191-1	LFM-99-05A-SPR22	05-MAY-22 10:14	10-MAY-22		31-MAY-22		
Sample Comments: 1 vial has headspace (680-215136-1)							
<i>Matrix</i>	<i>Product</i>	<i>Hold Date (shortest)</i>	<i>Notes</i>		<i>Bottle Type</i>		
Aqueous	S MA-EPH	19-MAY-22			1L N-Amber Glass		
Aqueous	S MA-VPH	19-MAY-22			40mL Vial+HCl		
SP2191-2	DCL-DUP01-SPR22	05-MAY-22 13:24	10-MAY-22		31-MAY-22		
Sample Comments: 1 amber arrived broken (680-215136-2)							
<i>Matrix</i>	<i>Product</i>	<i>Hold Date (shortest)</i>	<i>Notes</i>		<i>Bottle Type</i>		
Aqueous	S MA-EPH	19-MAY-22			1L N-Amber Glass		
Aqueous	S MA-VPH	19-MAY-22			40mL Vial+HCl		

Total Samples: 2
Total Analyses: 4

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SAMPLE DATA SUMMARY PACKAGE

KATAHDIN ANALYTICAL SERVICES - ORGANIC DATA QUALIFIERS

The sampled date indicated on the attached Report(s) of Analysis (ROA) is the date for which a grab sample was collected or the date for which a composite sample was completed. Beginning and start times for composite samples can be found on the Chain-of-Custody.

U Indicates the compound was analyzed for but not detected above the specified level. This level may be the Limit of Quantitation (LOQ)(previously called Practical Quantitation Level (PQL)), the Limit of Detection (LOD) or Method Detection Limit (MDL) as required by the client.

Note: All results reported as "U" MDL have a 50% rate for false negatives compared to those results reported as "U" PQL/LOQ or "U" LOD, where the rate of false negatives is <1%.

* Compound recovery or percent RPD (relative percent difference) was outside of quality control limits.

D Indicates the result was obtained from analysis of a diluted sample. Surrogate recoveries may not be calculable.

E Estimated value. This flag identifies compounds whose concentrations exceed the upper level of the calibration range of the instrument for that specific analysis.

J Estimated value. The analyte was detected in the sample at a concentration less than the laboratory Limit of Quantitation (LOQ)(previously called Practical Quantitation Limit (PQL)), but above the Method Detection Limit (MDL).

or

J Used for Pesticides, PCBs, Herbicides, Formaldehyde, Explosives and Method 504.1 analytes when there is a greater than 40% difference for detected concentrations between the two GC columns.

B Indicates the analyte was detected in the laboratory method blank analyzed concurrently with the sample.

C Indicates that the flagged compound did not meet DoD criteria in the corresponding daily calibration verification (CV).

L Indicates that the flagged compound did not meet DoD criteria in the corresponding Laboratory Control Sample (LCS) and/or Laboratory Control Sample Duplicate (LCSD) prepared and/or analyzed concurrently with the sample.

M Indicates that the flagged compound did not meet DoD criteria in the Matrix Spike and/or Matrix Spike Duplicate prepared and/or analyzed concurrently with the native sample.

N Presumptive evidence of a compound based on a mass spectral library search.

A Indicates that a tentatively identified compound is a suspected aldol-condensation product.

P Used for Pesticide/Aroclor analyte when there is a greater than 25% difference for detected concentrations between the two GC columns. (for CLP methods only).

Report of Analytical Results

SDG: SP2191
Lab ID: SP2191-1
Client ID: LFM-99-05A-SPR22
Matrix: AQ
Lab File ID: CPE20178.D

Sample Date: 05-MAY-22
Extract Date: 12-MAY-22
Extracted By: AP/GN
Extraction Method: SW846 3510C
Lab Prep Batch: WG318022

Report Date: 04-JUN-22
Analysis Date: 25-MAY-22
Analyst: JLP
Analysis Method: MA DEP EPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C9-C18 Aliphatics	U	72	ug/L	1	100	96.	48.	72.
C19-C36 Aliphatics	U	72	ug/L	1	100	96.	48.	72.
C11-C22 Aromatics	U	72	ug/L	1	100	96.	48.	72.
Naphthalene	U	1.4	ug/L	1	2	1.9	0.86	1.4
2-Methylnaphthalene	U	1.4	ug/L	1	2	1.9	0.77	1.4
Phenanthrene	U	1.4	ug/L	1	2	1.9	0.86	1.4
Acenaphthylene	U	1.4	ug/L	1	2	1.9	0.77	1.4
Acenaphthene	U	1.8	ug/L	1	2	1.9	1.7	1.8
Anthracene	U	1.4	ug/L	1	2	1.9	1.3	1.4
Benzo(a)anthracene	U	1.4	ug/L	1	2	1.9	1.3	1.4
Benzo(a)pyrene	U	1.4	ug/L	1	2	1.9	1.2	1.4
Benzo(b)fluoranthene	U	1.4	ug/L	1	2	1.9	0.77	1.4
Benzo(g,h,i)perylene	U	1.4	ug/L	1	2	1.9	1.2	1.4
Benzo(k)fluoranthene	U	1.4	ug/L	1	2	1.9	0.96	1.4
Chrysene	U	1.4	ug/L	1	2	1.9	0.86	1.4
Dibenzo(a,h)anthracene	U	1.4	ug/L	1	2	1.9	1.2	1.4
Fluoranthene	U	1.4	ug/L	1	2	1.9	0.77	1.4
Fluorene	U	1.4	ug/L	1	2	1.9	0.86	1.4
Indeno(1,2,3-cd)pyrene	U	1.4	ug/L	1	2	1.9	1.3	1.4
Pyrene	U	1.4	ug/L	1	2	1.9	1.0	1.4
5-Alpha Androstane	*	11.2	%					
o-Terphenyl		48.3	%					
2-Fluorobiphenyl		92.0	%					
2-Bromonaphthalene		83.7	%					

Report of Analytical Results

SDG: SP2191
Lab ID: SP2191-1RE
Client ID: LFM-99-05A-SPR22
Matrix: AQ
Lab File ID: CPF20018.D

Sample Date: 05-MAY-22
Extract Date: 26-MAY-22
Extracted By: CMW/SR
Extraction Method: SW846 3510C
Lab Prep Batch: WG318787

Report Date: 04-JUN-22
Analysis Date: 02-JUN-22
Analyst: JLP
Analysis Method: MA DEP EPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C9-C18 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C19-C36 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C11-C22 Aromatics	U	75	ug/L	1	100	100	50.	75.
Naphthalene	U	1.5	ug/L	1	2	2.0	0.90	1.5
2-Methylnaphthalene	U	1.5	ug/L	1	2	2.0	0.80	1.5
Phenanthrene	U	1.5	ug/L	1	2	2.0	0.90	1.5
Acenaphthylene	U	1.5	ug/L	1	2	2.0	0.80	1.5
Acenaphthene	U	1.9	ug/L	1	2	2.0	1.8	1.9
Anthracene	U	1.5	ug/L	1	2	2.0	1.4	1.5
Benzo(a)anthracene	U	1.5	ug/L	1	2	2.0	1.4	1.5
Benzo(a)pyrene	U	1.5	ug/L	1	2	2.0	1.3	1.5
Benzo(b)fluoranthene	U	1.5	ug/L	1	2	2.0	0.80	1.5
Benzo(g,h,i)perylene	U	1.5	ug/L	1	2	2.0	1.3	1.5
Benzo(k)fluoranthene	U	1.5	ug/L	1	2	2.0	1.0	1.5
Chrysene	U	1.5	ug/L	1	2	2.0	0.90	1.5
Dibenzo(a,h)anthracene	U	1.5	ug/L	1	2	2.0	1.2	1.5
Fluoranthene	U	1.5	ug/L	1	2	2.0	0.80	1.5
Fluorene	U	1.5	ug/L	1	2	2.0	0.90	1.5
Indeno(1,2,3-cd)pyrene	U	1.5	ug/L	1	2	2.0	1.4	1.5
Pyrene	U	1.5	ug/L	1	2	2.0	1.1	1.5
5-Alpha Androstane		47.8	%					
o-Terphenyl	*	32.0	%					
2-Fluorobiphenyl		88.3	%					
2-Bromonaphthalene		74.1	%					

Report of Analytical Results

SDG: SP2191
Lab ID: SP2191-2
Client ID: DCL-DUP01-SPR22
Matrix: AQ
Lab File ID: CPE20179.D

Sample Date: 05-MAY-22
Extract Date: 12-MAY-22
Extracted By: AP/GN
Extraction Method: SW846 3510C
Lab Prep Batch: WG318022

Report Date: 04-JUN-22
Analysis Date: 26-MAY-22
Analyst: JLP
Analysis Method: MA DEP EPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C9-C18 Aliphatics	U	71	ug/L	1	100	94.	47.	71.
C19-C36 Aliphatics	U	71	ug/L	1	100	94.	47.	71.
C11-C22 Aromatics	U	71	ug/L	1	100	94.	47.	71.
Naphthalene	U	1.4	ug/L	1	2	1.9	0.85	1.4
2-Methylnaphthalene	U	1.4	ug/L	1	2	1.9	0.75	1.4
Phenanthrene	U	1.4	ug/L	1	2	1.9	0.85	1.4
Acenaphthylene	U	1.4	ug/L	1	2	1.9	0.75	1.4
Acenaphthene	U	1.8	ug/L	1	2	1.9	1.7	1.8
Anthracene	U	1.4	ug/L	1	2	1.9	1.3	1.4
Benzo(a)anthracene	U	1.4	ug/L	1	2	1.9	1.3	1.4
Benzo(a)pyrene	U	1.4	ug/L	1	2	1.9	1.2	1.4
Benzo(b)fluoranthene	U	1.4	ug/L	1	2	1.9	0.75	1.4
Benzo(g,h,i)perylene	U	1.4	ug/L	1	2	1.9	1.2	1.4
Benzo(k)fluoranthene	U	1.4	ug/L	1	2	1.9	0.94	1.4
Chrysene	U	1.4	ug/L	1	2	1.9	0.85	1.4
Dibenzo(a,h)anthracene	U	1.4	ug/L	1	2	1.9	1.1	1.4
Fluoranthene	U	1.4	ug/L	1	2	1.9	0.75	1.4
Fluorene	U	1.4	ug/L	1	2	1.9	0.85	1.4
Indeno(1,2,3-cd)pyrene	U	1.4	ug/L	1	2	1.9	1.3	1.4
Pyrene	U	1.4	ug/L	1	2	1.9	1.0	1.4
5-Alpha Androstane	*	8.70	%					
o-Terphenyl		41.3	%					
2-Fluorobiphenyl		89.5	%					
2-Bromonaphthalene		91.0	%					

Report of Analytical Results

SDG: SP2191
Lab ID: WG318022-1
Client ID: Method Blank
Matrix: AQ
Lab File ID: CPE20170.D

Sample Date: N/A
Extract Date: 12-MAY-22
Extracted By: AP/GN
Extraction Method: SW846 3510C
Lab Prep Batch: WG318022

Report Date: 04-JUN-22
Analysis Date: 25-MAY-22
Analyst: JLP
Analysis Method: MA DEP EPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C9-C18 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C19-C36 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C11-C22 Aromatics	U	75	ug/L	1	100	100	50.	75.
Naphthalene	U	1.5	ug/L	1	2	2.0	0.90	1.5
2-Methylnaphthalene	U	1.5	ug/L	1	2	2.0	0.80	1.5
Phenanthrene	U	1.5	ug/L	1	2	2.0	0.90	1.5
Acenaphthylene	U	1.5	ug/L	1	2	2.0	0.80	1.5
Acenaphthene	U	1.9	ug/L	1	2	2.0	1.8	1.9
Anthracene	U	1.5	ug/L	1	2	2.0	1.4	1.5
Benzo(a)anthracene	U	1.5	ug/L	1	2	2.0	1.4	1.5
Benzo(a)pyrene	U	1.5	ug/L	1	2	2.0	1.3	1.5
Benzo(b)fluoranthene	U	1.5	ug/L	1	2	2.0	0.80	1.5
Benzo(g,h,i)perylene	U	1.5	ug/L	1	2	2.0	1.3	1.5
Benzo(k)fluoranthene	U	1.5	ug/L	1	2	2.0	1.0	1.5
Chrysene	U	1.5	ug/L	1	2	2.0	0.90	1.5
Dibenzo(a,h)anthracene	U	1.5	ug/L	1	2	2.0	1.2	1.5
Fluoranthene	U	1.5	ug/L	1	2	2.0	0.80	1.5
Fluorene	U	1.5	ug/L	1	2	2.0	0.90	1.5
Indeno(1,2,3-cd)pyrene	U	1.5	ug/L	1	2	2.0	1.4	1.5
Pyrene	U	1.5	ug/L	1	2	2.0	1.1	1.5
5-Alpha Androstane		58.2	%					
o-Terphenyl		65.1	%					
2-Fluorobiphenyl		89.7	%					
2-Bromonaphthalene		74.7	%					

Report of Analytical Results

SDG: SP2191
Lab ID: WG318787-1
Client ID: Method Blank
Matrix: AQ
Lab File ID: CPF20013.D

Sample Date: N/A
Extract Date: 26-MAY-22
Extracted By: CMW/SR
Extraction Method: SW846 3510C
Lab Prep Batch: WG318787

Report Date: 04-JUN-22
Analysis Date: 01-JUN-22
Analyst: JLP
Analysis Method: MA DEP EPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C9-C18 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C19-C36 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C11-C22 Aromatics	U	75	ug/L	1	100	100	50.	75.
Naphthalene	U	1.5	ug/L	1	2	2.0	0.90	1.5
2-Methylnaphthalene	U	1.5	ug/L	1	2	2.0	0.80	1.5
Phenanthrene	U	1.5	ug/L	1	2	2.0	0.90	1.5
Acenaphthylene	U	1.5	ug/L	1	2	2.0	0.80	1.5
Acenaphthene	U	1.9	ug/L	1	2	2.0	1.8	1.9
Anthracene	U	1.5	ug/L	1	2	2.0	1.4	1.5
Benzo(a)anthracene	U	1.5	ug/L	1	2	2.0	1.4	1.5
Benzo(a)pyrene	U	1.5	ug/L	1	2	2.0	1.3	1.5
Benzo(b)fluoranthene	U	1.5	ug/L	1	2	2.0	0.80	1.5
Benzo(g,h,i)perylene	U	1.5	ug/L	1	2	2.0	1.3	1.5
Benzo(k)fluoranthene	U	1.5	ug/L	1	2	2.0	1.0	1.5
Chrysene	U	1.5	ug/L	1	2	2.0	0.90	1.5
Dibenzo(a,h)anthracene	U	1.5	ug/L	1	2	2.0	1.2	1.5
Fluoranthene	U	1.5	ug/L	1	2	2.0	0.80	1.5
Fluorene	U	1.5	ug/L	1	2	2.0	0.90	1.5
Indeno(1,2,3-cd)pyrene	U	1.5	ug/L	1	2	2.0	1.4	1.5
Pyrene	U	1.5	ug/L	1	2	2.0	1.1	1.5
5-Alpha Androstane		40.7	%					
o-Terphenyl	*	30.8	%					
2-Fluorobiphenyl		86.8	%					
2-Bromonaphthalene		81.4	%					

Form 2 System Monitoring Compound Recovery

Lab Name: Katahdin Analytical Services **SDG:** SP2191

Matrix: AQ

Client Sample ID	Lab Sample ID	Col. ID	2BN	#	2FBP	#	5AA	#	OTP	#
LFM-99-05A-SPR22	SP2191-1		83.7		92.0		11.2	*	48.3	
LFM-99-05A-SPR22	SP2191-1RE		74.1		88.3		47.8		32.0	*
DCL-DUP01-SPR22	SP2191-2		91.0		89.5		8.70	*	41.3	
Method Blank	WG318022-1		74.7		89.7		58.2		65.1	
Laboratory Control S	WG318022-2		81.3		93.4		56.6		70.4	
Laboratory Control S	WG318022-3		74.7		95.7		0.00	*	0.00	*
Method Blank	WG318787-1		81.4		86.8		40.7		30.8	*
Laboratory Control S	WG318787-2		79.4		88.6		50.8		31.8	*
Laboratory Control S	WG318787-3		92.1		89.8		48.9		31.6	*

QC Limits

2BN	2-BROMONAPHTHALENE	40-140
2FBP	2-FLUOROBIPHENYL	40-140
5AA	5-ALPHA ANDROSTANE	40-140
OTP	O-TERPHENYL	40-140

= Column to be used to flag recovery limits.
 * = Values outside of contract required QC limits.
 D= System Monitoring Compound diluted out.

LCS/LCSD Recovery Report

LCS ID: WG318022-2
LCSD ID: WG318022-3
SDG: SP2191
LCS File ID: CPE20171.D

Extract Date: 12-MAY-22
Extracted By: AP/GN
Extraction Method: SW846 3510C
Lab Prep Batch: WG318022
LCSD File ID: CPE10172.D

Analysis Date: 25-MAY-22
Analyst: JLP
Analysis Method: MA DEP EPH 04-1.1
Matrix: AQ
Report Date: 04-JUN-22

Compound	Spike Amt	LCS Conc	LCS Rec (%)	LCSD Conc	LCSD Rec (%)	Conc Units	RPD (%)	RPD Limit	Limits
Unadjusted C11-C22 Aromatics	1530	1050	68.6	894.	58.4	ug/L	16	25	40-140
C9-C18 Aliphatics	540.	301.	55.7	239.	44.2	ug/L	23	25	40-140
C19-C36 Aliphatics	720.	511.	71.0	408.	56.7	ug/L	22	25	40-140
Naphthalene	90.0	53.6	59.6	45.1	50.1	ug/L	17	25	40-140
2-Methylnaphthalene	90.0	53.0	58.9	43.5	48.3	ug/L	20	25	40-140
Phenanthrene	90.0	60.0	66.7	51.8	57.6	ug/L	15	25	40-140
Acenaphthylene	90.0	53.3	59.2	47.0	52.2	ug/L	12	25	40-140
Acenaphthene	90.0	55.8	62.0	48.2	53.6	ug/L	15	25	40-140
Anthracene	90.0	63.9	71.0	54.5	60.6	ug/L	16	25	40-140
Benzo(a)anthracene	90.0	66.4	73.8	55.5	61.7	ug/L	18	25	40-140
Benzo(a)pyrene	90.0	64.2	71.3	53.1	59.0	ug/L	19	25	40-140
Benzo(b)fluoranthene	90.0	65.1	72.3	52.9	58.8	ug/L	21	25	40-140
Benzo(g,h,i)perylene	90.0	60.6	67.3	50.5	56.1	ug/L	18	25	40-140
Benzo(k)fluoranthene	90.0	63.2	70.2	53.9	59.9	ug/L	16	25	40-140
Chrysene	90.0	61.0	67.8	51.8	57.6	ug/L	16	25	40-140
Dibenzo(a,h)anthracene	90.0	63.3	70.3	53.2	59.1	ug/L	17	25	40-140
Fluoranthene	90.0	60.8	67.6	51.8	57.6	ug/L	16	25	40-140
Fluorene	90.0	58.4	64.9	50.7	56.3	ug/L	14	25	40-140
Indeno(1,2,3-cd)pyrene	90.0	58.9	65.4	49.2	54.7	ug/L	18	25	40-140
Pyrene	90.0	60.2	66.9	51.3	57.0	ug/L	16	25	40-140
5-Alpha Androstane			56.6		0.00*				40-140
o-Terphenyl			70.4		0.00*				40-140
2-Fluorobiphenyl			93.4		95.7				40-140
2-Bromonaphthalene			81.3		74.7				40-140

LCS/LCSD Recovery Report

LCS ID: WG318787-2
LCSD ID: WG318787-3
SDG: SP2191
LCS File ID: CPF20014.D

Extract Date: 26-MAY-22
Extracted By: CMW/SR
Extraction Method: SW846 3510C
Lab Prep Batch: WG318787
LCSD File ID: CPF10015.D

Analysis Date: 01-JUN-22
Analyst: JLP
Analysis Method: MA DEP EPH 04-1.1
Matrix: AQ
Report Date: 04-JUN-22

Compound	Spike Amt	LCS Conc	LCS Rec (%)	LCSD Conc	LCSD Rec (%)	Conc Units	RPD (%)	RPD Limit	Limits
Unadjusted C11-C22 Aromatics	1530	1110	72.5	1100	71.9	ug/L	1	25	40-140
C9-C18 Aliphatics	540.	341.	63.1	386.	71.5	ug/L	12	25	40-140
C19-C36 Aliphatics	720.	553.	76.8	668.	92.8	ug/L	19	25	40-140
Naphthalene	90.0	55.2	61.3	53.3	59.2	ug/L	4	25	40-140
2-Methylnaphthalene	90.0	57.1	63.4	55.1	61.2	ug/L	4	25	40-140
Phenanthrene	90.0	63.9	71.0	61.9	68.8	ug/L	3	25	40-140
Acenaphthylene	90.0	56.8	63.1	54.3	60.3	ug/L	4	25	40-140
Acenaphthene	90.0	59.3	65.9	56.8	63.1	ug/L	4	25	40-140
Anthracene	90.0	68.6	76.2	66.6	74.0	ug/L	3	25	40-140
Benzo(a)anthracene	90.0	70.0	77.8	69.2	76.9	ug/L	1	25	40-140
Benzo(a)pyrene	90.0	69.5	77.2	69.4	77.1	ug/L	0	25	40-140
Benzo(b)fluoranthene	90.0	67.3	74.8	64.7	71.9	ug/L	4	25	40-140
Benzo(g,h,i)perylene	90.0	64.1	71.2	64.9	72.1	ug/L	1	25	40-140
Benzo(k)fluoranthene	90.0	68.7	76.3	71.0	78.9	ug/L	3	25	40-140
Chrysene	90.0	64.6	71.8	63.4	70.4	ug/L	2	25	40-140
Dibenzo(a,h)anthracene	90.0	66.0	73.3	66.7	74.1	ug/L	1	25	40-140
Fluoranthene	90.0	64.1	71.2	62.8	69.8	ug/L	2	25	40-140
Fluorene	90.0	61.6	68.4	59.2	65.8	ug/L	4	25	40-140
Indeno(1,2,3-cd)pyrene	90.0	65.9	73.2	66.3	73.7	ug/L	1	25	40-140
Pyrene	90.0	64.4	71.6	63.2	70.2	ug/L	2	25	40-140
5-Alpha Androstane			50.8		48.9				40-140
o-Terphenyl			31.8*		31.6*				40-140
2-Fluorobiphenyl			88.6		89.8				40-140
2-Bromonaphthalene			79.4		92.1				40-140

Form 4 Method Blank Summary

Lab Name : Katahdin Analytical Services
Lab Sample ID : WG318022-1
Lab File ID : CPE10170.D
Instrument ID : GC12

SDG : SP2191
Date Analyzed : 25-MAY-22
Time Analyzed : 15:45
Date Extracted : 12-MAY-22

This Method Blank applies to the following samples and QC Samples:

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Laboratory Control S	WG318022-2	CPE10171.D	05/25/22	16:40
Laboratory Control S	WG318022-3	CPE10172.D	05/25/22	17:38
LFM-99-05A-SPR22	SP2191-1	CPE10178.D	05/25/22	23:20
DCL-DUP01-SPR22	SP2191-2	CPE10179.D	05/26/22	00:17



Form 4 Method Blank Summary

Lab Name : Katahdin Analytical Services
Lab Sample ID : WG318022-1
Lab File ID : CPE10170A.D
Instrument ID : GC12

SDG : SP2191
Date Analyzed : 25-MAY-22
Time Analyzed : 15:45
Date Extracted : 12-MAY-22

This Method Blank applies to the following samples and QC Samples:

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Laboratory Control S	WG318022-2	CPE10171A.D	05/25/22	16:40
Laboratory Control S	WG318022-3	CPE10172A.D	05/25/22	17:38
LFM-99-05A-SPR22	SP2191-1	CPE10178A.D	05/25/22	23:20
DCL-DUP01-SPR22	SP2191-2	CPE10179A.D	05/26/22	00:17



Form 4 Method Blank Summary

Lab Name : Katahdin Analytical Services
Lab Sample ID : WG318022-1
Lab File ID : CPE20170.D
Instrument ID : GC12

SDG : SP2191
Date Analyzed : 25-MAY-22
Time Analyzed : 15:45
Date Extracted : 12-MAY-22

This Method Blank applies to the following samples and QC Samples:

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Laboratory Control S	WG318022-2	CPE20171.D	05/25/22	16:40
Laboratory Control S	WG318022-3	CPE20172.D	05/25/22	17:38
LFM-99-05A-SPR22	SP2191-1	CPE20178.D	05/25/22	23:20
DCL-DUP01-SPR22	SP2191-2	CPE20179.D	05/26/22	00:17



Form 4 Method Blank Summary

Lab Name : Katahdin Analytical Services
Lab Sample ID : WG318787-1
Lab File ID : CPF10013.D
Instrument ID : GC12

SDG : SP2191
Date Analyzed : 01-JUN-22
Time Analyzed : 20:15
Date Extracted : 26-MAY-22

This Method Blank applies to the following samples and QC Samples:

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Laboratory Control S	WG318787-2	CPF10014.D	06/01/22	21:12
Laboratory Control S	WG318787-3	CPF10015.D	06/01/22	22:08
LFM-99-05A-SPR22	SP2191-1RE	CPF10018.D	06/02/22	00:59



Form 4 Method Blank Summary

Lab Name : Katahdin Analytical Services
Lab Sample ID : WG318787-1
Lab File ID : CPF10013A.D
Instrument ID : GC12

SDG : SP2191
Date Analyzed : 01-JUN-22
Time Analyzed : 20:15
Date Extracted : 26-MAY-22

This Method Blank applies to the following samples and QC Samples:

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Laboratory Control S	WG318787-2	CPF10014A.D	06/01/22	21:12
Laboratory Control S	WG318787-3	CPF10015A.D	06/01/22	22:08
LFM-99-05A-SPR22	SP2191-1RE	CPF10018A.D	06/02/22	00:59



Form 4 Method Blank Summary

Lab Name : Katahdin Analytical Services
Lab Sample ID : WG318787-1
Lab File ID : CPF20013.D
Instrument ID : GC12

SDG : SP2191
Date Analyzed : 01-JUN-22
Time Analyzed : 20:15
Date Extracted : 26-MAY-22

This Method Blank applies to the following samples and QC Samples:

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Laboratory Control S	WG318787-2	CPF20014.D	06/01/22	21:12
Laboratory Control S	WG318787-3	CPF20015.D	06/01/22	22:08
LFM-99-05A-SPR22	SP2191-1RE	CPF20018.D	06/02/22	00:59



Form 6 Initial Calibration Summary

Lab Name : Katahdin Analytical Services

SDG: SP2191

Instrument ID: GC12

Calibration Date(s): 06-MAY-22 10:36

Lab File IDs : CPE10027.D CPE10026.D CPE10023a.

06-MAY-22 14:59

CPE10025.D CPE10024.D

Level 1	Level 2	Level 3	Level 4	Level 5	Curve				%RSD or R ²
Level 1	Level 2	Level 3	Level 4	Level 5	Curve				Result Limit
Level 1	Level 2	Level 3	Level 4	Level 5	Curve				
1.0000	10.0000	50.0000	100.0000	200.0000	Type	b	m1	m2	
1.0000	10.0000	50.0000	100.0000	200.0000	Type	b	m1	m2	
1.0000	10.0000	50.0000	100.0000	200.0000	Type	b	m1	m2	

Compound	3057292	3037811	2682449	2409765	2762901		AVG		2790044		9.64628	25	O
Naphthalene	3351163	3487577	3173249	2870744	3153856		AVG		3207318		7.25428	25	O
2-Methylnaphthalene	3299544	3441998	3098331	2798176	3082906		AVG		3144191		7.76466	25	O
Acenaphthylene	3425687	3386890	3025049	2729263	3014760		AVG		3116330		9.31928	25	O
Acenaphthene	3461308	3499569	3120408	2817390	3110184		AVG		3201772		8.81737	25	O
Fluorene	3228516	3327827	2955495	2674764	2962561		AVG		3029833		8.48560	25	O
Phenanthrene	3100763	3254634	2877798	2616521	2882794		AVG		2946502		8.25077	25	O
Anthracene	3202629	2855962	2539748	2295643	2542158		AVG		2687228		13.02782	25	O
Fluoranthene	3168110	3224500	2814323	2568060	2791643		AVG		2913327		9.48702	25	O
Pyrene	3209362	3259917	2847531	2586384	2803656		AVG		2941370		9.72178	25	O
Benzo(a)Anthracene	2724698	2795849	2431594	2201352	2328668		AVG		2496432		10.23569	25	O
Chrysene	3010970	3006751	2623169	2379944	2502125		AVG		2704592		10.75092	25	O
Benzo(b)Fluoranthene	2958908	2982054	2556169	2251703	2388495		AVG		2627466		12.60819	25	O
Benzo(k)Fluoranthene	2786612	2722427	2382561	2161451	2368268		AVG		2484264		10.57643	25	O
Benzo(a)Pyrene	2598222	2483624	2175882	1930994	2168229		AVG		2271390		11.80309	25	O
Indeno(1,2,3-cd)Pyrene	2773549	2733667	2387674	2070388	3010456		AVG		2595147		14.18317	25	O
Dibenzo(a,h)Anthracene	2769509	2559143	2251147	1978736	2788864		AVG		2469480		14.15221	25	O
Benzo(g,h,i)Perylene	2904412	2620408	2341507	2034501	3069690		AVG		2594103		16.12763	25	O
2-Fluorobiphenyl	2997483	3116164	2812880	2540161	2808029		AVG		2854943		7.66626	25	
2-Bromonaphthalene	1976473	2091462	1887341	1709409	1898247		AVG		1912586		7.31068	25	
O-Terphenyl	3332188	3469411	2979408	2743080	2993980		AVG		3103613		9.44183	25	

Legend: O = Acceptable
W = Failed %RSD Value
X = Failed R² Value
Y = Failed Minimum RF

Form 6 Initial Calibration Summary

Lab Name : Katahdin Analytical Services

SDG: SP2191

Instrument ID: GC12

Calibration Date(s): 21-FEB-22 12:40

Lab File IDs : CPB20053.DCPB20052.DCPB20051.D

21-FEB-22 16:22

CPB20050.DCPB20049.D

Level 1	Level 2	Level 3	Level 4	Level 5	Curve			%RSD or R ²	
Level 1	Level 2	Level 3	Level 4	Level 5	Curve			Result	Limit
Level 1	Level 2	Level 3	Level 4	Level 5	Curve				
1.0000	20.0000	50.0000	100.0000	200.0000	Type	b	m1	m2	
1.0000	20.0000	50.0000	100.0000	200.0000	Type	b	m1	m2	
1.0000	20.0000	50.0000	100.0000	200.0000	Type	b	m1	m2	

	Level 1	Level 2	Level 3	Level 4	Level 5	Curve				%RSD or R ²	Result	Limit
C9-C18 Aliphatic	1022845	1323057	985617	1217924	1204653	AVG		1150819		12.34517	25	O
C19-C36 Aliphatic	937088	1283090	964097	1210095	1205987	AVG		1120072		14.10735	25	O
C-9	1049185	1322844	988857	1209195	1193204	AVG		1152657		11.58616	30	O
C-10	1078003	1327302	986556	1215709	1198075	AVG		1161129		11.33942	25	O
C-12	1030750	1349918	1005652	1240816	1224225	AVG		1170272		12.58222	25	O
C-14	1002013	1327576	989201	1224412	1210250	AVG		1150690		12.92322	25	O
C-16	1000059	1323648	985882	1223727	1213843	AVG		1149432		12.98310	25	O
C-18	977058	1287056	957555	1193688	1188324	AVG		1120736		12.99347	25	O
C-19	1002959	1304879	970903	1212823	1208397	AVG		1139992		12.75267	25	O
C-20	984039	1300389	969307	1213468	1209880	AVG		1135416		13.16398	25	O
C-22	946813	1295585	967271	1213466	1210730	AVG		1126773		14.09466	25	O
C-24	960843	1296116	968035	1213175	1206878	AVG		1129009		13.66906	25	O
C-26	975210	1293463	968335	1214251	1208367	AVG		1131925		13.25448	25	O
C-28	1010885	1304250	981181	1230520	1223790	AVG		1150125		12.56785	25	O
C-30	933937	1269015	958590	1202426	1196904	AVG		1112174		13.87709	25	O
C-36	682018	1201024	929155	1180634	1182949	AVG		1035156		21.94743	25	O
5-alpha androstane	1133073	1228298	1094842	1138147	1136002	AVG		1146072		4.30097	25	

Legend: O = Acceptable
 W = Failed %RSD Value
 X = Failed R² Value
 Y = Failed Minimum RF

Form 7 Calibration Verification Summary

Lab Name: Katahdin Analytical Services **SDG:** SP2191
Lab ID: WG318723-2 **Analytical Date:** 05/25/22 08:12
Lab File ID: CPE10164.D **Instrument ID:** GC12
Initial Calibration Date(s): 05/06/22 10:36 05/06/22 14:59 **Column ID:** A

Compound	RRF/Amount	RF50	Min RRF	%D/ %Drift	Max %D/ %Drift	Curve Type
Naphthalene	3207318	3057586	0.010	-4.66843	25.00000	Averaged
2-Methylnaphthalene	3144191	3014731	0.010	-4.11744	25.00000	Averaged
Acenaphthylene	3116330	2931755	0.010	-5.92281	25.00000	Averaged
Acenaphthene	3201772	3067918	0.010	-4.18061	25.00000	Averaged
Fluorene	3029833	2938051	0.010	-3.02926	25.00000	Averaged
Phenanthrene	2946502	2906102	0.010	-1.37110	25.00000	Averaged
Anthracene	2687228	2302478	0.010	-14.31773	25.00000	Averaged
Fluoranthene	2913327	2943195	0.010	1.02521	25.00000	Averaged
Pyrene	2941370	2929869	0.010	-0.39101	25.00000	Averaged
Benzo(a)Anthracene	2496432	2543796	0.010	1.89726	25.00000	Averaged
Chrysene	2704592	2776003	0.010	2.64038	25.00000	Averaged
Benzo(b)Fluoranthene	2627466	2703862	0.010	2.90760	25.00000	Averaged
Benzo(k)Fluoranthene	2484264	2658093	0.010	6.99721	25.00000	Averaged
Benzo(a)Pyrene	2271390	2296523	0.010	1.10651	25.00000	Averaged
Indeno(1,2,3-cd)Pyrene	2595147	2646001	0.010	1.95958	25.00000	Averaged
Dibenzo(a,h)Anthracene	2469480	2507842	0.010	1.55345	25.00000	Averaged
Benzo(g,h,i)Perylene	2594103	2549897	0.010	-1.70413	25.00000	Averaged
2-Fluorobiphenyl	2854943	2763360	0.010	-3.20787	25.00000	Averaged
2-Bromonaphthalene	1912586	1872224	0.010	-2.11036	25.00000	Averaged
O-Terphenyl	3103613	3073446	0.010	-0.97201	25.00000	Averaged

* = Compound out of QC criteria

Form 7 Calibration Verification Summary

Lab Name: Katahdin Analytical Services **SDG:** SP2191
Lab ID: WG318723-3 **Analytical Date:** 05/26/22 01:14
Lab File ID: CPE10180.D **Instrument ID:** GC12
Initial Calibration Date(s): 05/06/22 10:36 05/06/22 14:59 **Column ID:** A

Compound	RRF/Amount	RF50	Min RRF	%D/ %Drift	Max %D/ %Drift	Curve Type
Naphthalene	3207318	3902144	0.010	21.66378	25.00000	Averaged
2-Methylnaphthalene	3144191	3835973	0.010	22.00191	25.00000	Averaged
Acenaphthylene	3116330	3722118	0.010	19.43916	25.00000	Averaged
Acenaphthene	3201772	3883419	0.010	21.28970	25.00000	Averaged
Fluorene	3029833	3704934	0.010	22.28180	25.00000	Averaged
Phenanthrene	2946502	3642995	0.010	23.63798	25.00000	Averaged
Anthracene	2687228	2844531	0.010	5.85371	25.00000	Averaged
Fluoranthene	2913327	3657858	0.010	25.55604	25.00000	Averaged <-
Pyrene	2941370	3637115	0.010	23.65378	25.00000	Averaged
Benzo(a)Anthracene	2496432	3131805	0.010	25.45125	25.00000	Averaged <-
Chrysene	2704592	3420789	0.010	26.48078	25.00000	Averaged <-
Benzo(b)Fluoranthene	2627466	3381263	0.010	28.68913	25.00000	Averaged <-
Benzo(k)Fluoranthene	2484264	3217962	0.010	29.53383	25.00000	Averaged <-
Benzo(a)Pyrene	2271390	2823223	0.010	24.29493	25.00000	Averaged
Indeno(1,2,3-cd)Pyrene	2595147	3293637	0.010	26.91526	25.00000	Averaged <-
Dibenzo(a,h)Anthracene	2469480	3098148	0.010	25.45753	25.00000	Averaged <-
Benzo(g,h,i)Perylene	2594103	3156760	0.010	21.68983	25.00000	Averaged
2-Fluorobiphenyl	2854943	3500308	0.010	22.60518	25.00000	Averaged
2-Bromonaphthalene	1912586	2363152	0.010	23.55791	25.00000	Averaged
O-Terphenyl	3103613	3840235	0.010	23.73431	25.00000	Averaged

* = Compound out of QC criteria

Form 7 Calibration Verification Summary

Lab Name: Katahdin Analytical Services **SDG:** SP2191
Lab ID: WG318723-4 **Analytical Date:** 06/01/22 11:27
Lab File ID: CPF10004.D **Instrument ID:** GC12
Initial Calibration Date(s): 05/06/22 10:36 05/06/22 14:59 **Column ID:** A

Compound	RRF/Amount	RF50	Min RRF	%D/ %Drift	Max %D/ %Drift	Curve Type
Naphthalene	3207318	3132611	0.010	-2.32925	25.00000	Averaged
2-Methylnaphthalene	3144191	3075561	0.010	-2.18276	25.00000	Averaged
Acenaphthylene	3116330	3004664	0.010	-3.58324	25.00000	Averaged
Acenaphthene	3201772	3101933	0.010	-3.11823	25.00000	Averaged
Fluorene	3029833	2983918	0.010	-1.51543	25.00000	Averaged
Phenanthrene	2946502	2950415	0.010	0.13281	25.00000	Averaged
Anthracene	2687228	2215657	0.010	-17.54859	25.00000	Averaged
Fluoranthene	2913327	2977401	0.010	2.19934	25.00000	Averaged
Pyrene	2941370	2979019	0.010	1.27997	25.00000	Averaged
Benzo(a)Anthracene	2496432	2560593	0.010	2.57010	25.00000	Averaged
Chrysene	2704592	2792835	0.010	3.26271	25.00000	Averaged
Benzo(b)Fluoranthene	2627466	2822346	0.010	7.41702	25.00000	Averaged
Benzo(k)Fluoranthene	2484264	2596894	0.010	4.53374	25.00000	Averaged
Benzo(a)Pyrene	2271390	2343846	0.010	3.18992	25.00000	Averaged
Indeno(1,2,3-cd)Pyrene	2595147	2671872	0.010	2.95651	25.00000	Averaged
Dibenzo(a,h)Anthracene	2469480	2531392	0.010	2.50710	25.00000	Averaged
Benzo(g,h,i)Perylene	2594103	2634021	0.010	1.53878	25.00000	Averaged
2-Fluorobiphenyl	2854943	2814510	0.010	-1.41625	25.00000	Averaged
2-Bromonaphthalene	1912586	1901291	0.010	-0.59061	25.00000	Averaged
O-Terphenyl	3103613	3115932	0.010	0.39690	25.00000	Averaged

* = Compound out of QC criteria

Form 7 Calibration Verification Summary

Lab Name: Katahdin Analytical Services **SDG:** SP2191
Lab ID: WG318723-5 **Analytical Date:** 06/02/22 08:29
Lab File ID: CPF10026.D **Instrument ID:** GC12
Initial Calibration Date(s): 05/06/22 10:36 05/06/22 14:59 **Column ID:** A

Compound	RRF/Amount	RF50	Min RRF	%D/ %Drift	Max %D/ %Drift	Curve Type
Naphthalene	3207318	3813195	0.010	18.89046	25.00000	Averaged
2-Methylnaphthalene	3144191	3746204	0.010	19.14683	25.00000	Averaged
Acenaphthylene	3116330	3619974	0.010	16.16145	25.00000	Averaged
Acenaphthene	3201772	3787276	0.010	18.28689	25.00000	Averaged
Fluorene	3029833	3618723	0.010	19.43639	25.00000	Averaged
Phenanthrene	2946502	3564671	0.010	20.97977	25.00000	Averaged
Anthracene	2687228	2621310	0.010	-2.45301	25.00000	Averaged
Fluoranthene	2913327	3605325	0.010	23.75285	25.00000	Averaged
Pyrene	2941370	3569090	0.010	21.34108	25.00000	Averaged
Benzo(a)Anthracene	2496432	3056251	0.010	22.42474	25.00000	Averaged
Chrysene	2704592	3349074	0.010	23.82917	25.00000	Averaged
Benzo(b)Fluoranthene	2627466	3322795	0.010	26.46387	25.00000	Averaged <-
Benzo(k)Fluoranthene	2484264	3123477	0.010	25.73050	25.00000	Averaged <-
Benzo(a)Pyrene	2271390	2756752	0.010	21.36850	25.00000	Averaged
Indeno(1,2,3-cd)Pyrene	2595147	3147045	0.010	21.26656	25.00000	Averaged
Dibenzo(a,h)Anthracene	2469480	3033176	0.010	22.82651	25.00000	Averaged
Benzo(g,h,i)Perylene	2594103	3064731	0.010	18.14220	25.00000	Averaged
2-Fluorobiphenyl	2854943	3415306	0.010	19.62780	25.00000	Averaged
2-Bromonaphthalene	1912586	2309716	0.010	20.76399	25.00000	Averaged
O-Terphenyl	3103613	3771377	0.010	21.51570	25.00000	Averaged

* = Compound out of QC criteria

Form 7 Calibration Verification Summary

Lab Name: Katahdin Analytical Services **SDG:** SP2191
Lab ID: WG318723-2 **Analytical Date:** 05/25/22 08:12
Lab File ID: CPE20164.D **Instrument ID:** GC12
Initial Calibration Date(s): 02/21/22 12:40 02/21/22 16:22 **Column ID:** B

Compound	RRF/Amount	RF50	Min RRF	%D/ %Drift	Max %D/ %Drift	Curve Type
C9-C18 Aliphatic	1150819	1104586	0.010	-4.01748	25.00000	Averaged
C19-C36 Aliphatic	1120072	1128111	0.010	0.71775	25.00000	Averaged
C-9	1152657	1081927	0.010	-6.13622	30.00000	Averaged
C-10	1161129	1095550	0.010	-5.64787	25.00000	Averaged
C-12	1170272	1095060	0.010	-6.42691	25.00000	Averaged
C-14	1150690	1105729	0.010	-3.90735	25.00000	Averaged
C-16	1149432	1125396	0.010	-2.09106	25.00000	Averaged
C-18	1120736	1123851	0.010	0.27790	25.00000	Averaged
C-19	1139992	1133268	0.010	-0.58988	25.00000	Averaged
C-20	1135416	1131981	0.010	-0.30256	25.00000	Averaged
C-22	1126773	1160895	0.010	3.02828	25.00000	Averaged
C-24	1129009	1060971	0.010	-6.02638	25.00000	Averaged
C-26	1131925	1176638	0.010	3.95016	25.00000	Averaged
C-28	1150125	1146302	0.010	-0.33238	25.00000	Averaged
C-30	1112174	1131099	0.010	1.70159	25.00000	Averaged
C-36	1035156	1083733	0.010	4.69269	25.00000	Averaged
5-alpha androstane	1146072	1229988	0.010	7.32203	25.00000	Averaged

* = Compound out of QC criteria

Form 7 Calibration Verification Summary

Lab Name: Katahdin Analytical Services **SDG:** SP2191
Lab ID: WG318723-3 **Analytical Date:** 05/26/22 01:14
Lab File ID: CPE20180.D **Instrument ID:** GC12
Initial Calibration Date(s): 02/21/22 12:40 02/21/22 16:22 **Column ID:** B

Compound	RRF/Amount	RF50	Min RRF	%D/ %Drift	Max %D/ %Drift	Curve Type
C9-C18 Aliphatic	1150819	1097341	0.010	-4.64701	25.00000	Averaged
C19-C36 Aliphatic	1120072	1119124	0.010	-0.08456	25.00000	Averaged
C-9	1152657	1076077	0.010	-6.64379	30.00000	Averaged
C-10	1161129	1083868	0.010	-6.65394	25.00000	Averaged
C-12	1170272	1085302	0.010	-7.26070	25.00000	Averaged
C-14	1150690	1099280	0.010	-4.46779	25.00000	Averaged
C-16	1149432	1119922	0.010	-2.56730	25.00000	Averaged
C-18	1120736	1119595	0.010	-0.10181	25.00000	Averaged
C-19	1139992	1129454	0.010	-0.92440	25.00000	Averaged
C-20	1135416	1127839	0.010	-0.66739	25.00000	Averaged
C-22	1126773	1155011	0.010	2.50613	25.00000	Averaged
C-24	1129009	1053256	0.010	-6.70970	25.00000	Averaged
C-26	1131925	1165729	0.010	2.98639	25.00000	Averaged
C-28	1150125	1133833	0.010	-1.41652	25.00000	Averaged
C-30	1112174	1118138	0.010	0.53621	25.00000	Averaged
C-36	1035156	1069735	0.010	3.34046	25.00000	Averaged
5-alpha androstane	1146072	1217645	0.010	6.24503	25.00000	Averaged

* = Compound out of QC criteria

Form 7 Calibration Verification Summary

Lab Name: Katahdin Analytical Services **SDG:** SP2191
Lab ID: WG318723-4 **Analytical Date:** 06/01/22 11:28
Lab File ID: CPF20004.D **Instrument ID:** GC12
Initial Calibration Date(s): 02/21/22 12:40 02/21/22 16:22 **Column ID:** B

Compound	RRF/Amount	RF50	Min RRF	%D/ %Drift	Max %D/ %Drift	Curve Type
C9-C18 Aliphatic	1150819	1089432	0.010	-5.33420	25.00000	Averaged
C19-C36 Aliphatic	1120072	1016422	0.010	-9.25387	25.00000	Averaged
C-9	1152657	1076161	0.010	-6.63645	30.00000	Averaged
C-10	1161129	1082142	0.010	-6.80264	25.00000	Averaged
C-12	1170272	1081037	0.010	-7.62514	25.00000	Averaged
C-14	1150690	1091507	0.010	-5.14329	25.00000	Averaged
C-16	1149432	1107354	0.010	-3.66070	25.00000	Averaged
C-18	1120736	1098393	0.010	-1.99361	25.00000	Averaged
C-19	1139992	1101467	0.010	-3.37940	25.00000	Averaged
C-20	1135416	1095661	0.010	-3.50142	25.00000	Averaged
C-22	1126773	1108073	0.010	-1.65957	25.00000	Averaged
C-24	1129009	996327	0.010	-11.75212	25.00000	Averaged
C-26	1131925	1084718	0.010	-4.17049	25.00000	Averaged
C-28	1150125	1035722	0.010	-9.94701	25.00000	Averaged
C-30	1112174	995213	0.010	-10.51644	25.00000	Averaged
C-36	1035156	714190	0.010	-31.00649	25.00000	Averaged <-
5-alpha androstane	1146072	1218654	0.010	6.33305	25.00000	Averaged

* = Compound out of QC criteria

Form 7 Calibration Verification Summary

Lab Name: Katahdin Analytical Services **SDG:** SP2191
Lab ID: WG318723-5 **Analytical Date:** 06/02/22 08:29
Lab File ID: CPF20026.D **Instrument ID:** GC12
Initial Calibration Date(s): 02/21/22 12:40 02/21/22 16:22 **Column ID:** B

Compound	RRF/Amount	RF50	Min RRF	%D/ %Drift	Max %D/ %Drift	Curve Type
C9-C18 Aliphatic	1150819	1132322	0.010	-1.60736	25.00000	Averaged
C19-C36 Aliphatic	1120072	1152383	0.010	2.88474	25.00000	Averaged
C-9	1152657	1106205	0.010	-4.02997	30.00000	Averaged
C-10	1161129	1116468	0.010	-3.84631	25.00000	Averaged
C-12	1170272	1117987	0.010	-4.46779	25.00000	Averaged
C-14	1150690	1135277	0.010	-1.33949	25.00000	Averaged
C-16	1149432	1159503	0.010	0.87623	25.00000	Averaged
C-18	1120736	1158489	0.010	3.36856	25.00000	Averaged
C-19	1139992	1167838	0.010	2.44266	25.00000	Averaged
C-20	1135416	1165761	0.010	2.67255	25.00000	Averaged
C-22	1126773	1193051	0.010	5.88208	25.00000	Averaged
C-24	1129009	1088682	0.010	-3.57190	25.00000	Averaged
C-26	1131925	1203529	0.010	6.32587	25.00000	Averaged
C-28	1150125	1168983	0.010	1.63968	25.00000	Averaged
C-30	1112174	1150951	0.010	3.48658	25.00000	Averaged
C-36	1035156	1080265	0.010	4.35768	25.00000	Averaged
5-alpha androstane	1146072	1261709	0.010	10.08985	25.00000	Averaged

* = Compound out of QC criteria

Form 8 Analytical Sequence

Lab Name: Katahdin Analytical Services
Instrument ID: GC12

SDG: SP2191
Sample Fraction: AROMATIC

Client Sample ID	Lab Sample ID	Date Analyzed	Time Analyzed	2BN	2FBP	OTP
Initial Calibration	WG317595-3	05/06/22	10:36	14.25	15.80	20.34
Initial Calibration	WG317595-5	05/06/22	12:13	14.25	15.80	20.35
Initial Calibration	WG317595-4	05/06/22	13:08	14.25	15.80	20.34
Initial Calibration	WG317595-2	05/06/22	14:04	14.25	15.80	20.34
Initial Calibration	WG317595-1	05/06/22	14:59	14.25	15.80	20.34
Independent Source	WG317595-6	05/06/22	15:54			
Continuing Calibrati	WG318723-2	05/25/22	08:12	14.24	15.79	20.33
Method Blank	WG318022-1	05/25/22	15:45	14.25	15.80	20.34
Laboratory Control S	WG318022-2	05/25/22	16:40	14.24	15.79	20.33
Laboratory Control S	WG318022-3	05/25/22	17:38	14.25	15.80	
LFM-99-05A-SPR22	SP2191-1	05/25/22	23:20	14.25	15.80	20.34
DCL-DUP01-SPR22	SP2191-2	05/26/22	00:17	14.25	15.80	20.34
Continuing Calibrati	WG318723-3	05/26/22	01:14	14.25	15.80	20.34
Continuing Calibrati	WG318723-4	06/01/22	11:27	14.25	15.80	20.34
Method Blank	WG318787-1	06/01/22	20:15	14.26	15.81	20.35
Laboratory Control S	WG318787-2	06/01/22	21:12	14.26	15.81	20.34
Laboratory Control S	WG318787-3	06/01/22	22:08	14.26	15.81	20.35
LFM-99-05A-SPR22	SP2191-1RE	06/02/22	00:59	14.26	15.81	20.35
Continuing Calibrati	WG318723-5	06/02/22	08:29	14.25	15.8	20.34



Form 8 Analytical Sequence

Lab Name: Katahdin Analytical Services
Instrument ID: GC12

SDG: SP2191
Sample Fraction: ALIPHATIC

Client Sample ID	Lab Sample ID	Date Analyzed	Time Analyzed	5AA	
Initial Calibration	WG314185-11	02/21/22	12:40	19.12	
Initial Calibration	WG314185-10	02/21/22	13:36	19.11	
Initial Calibration	WG314185-9	02/21/22	14:31	19.11	
Initial Calibration	WG314185-8	02/21/22	15:26	19.11	
Initial Calibration	WG314185-7	02/21/22	16:22	19.11	
Independent Source	WG314185-12	02/21/22	17:19		
Continuing Calibrati	WG318723-2	05/25/22	08:12	19.11	
Method Blank	WG318022-1	05/25/22	15:45	19.11	
Laboratory Control S	WG318022-2	05/25/22	16:40	19.11	
Laboratory Control S	WG318022-3	05/25/22	17:38		
LFM-99-05A-SPR22	SP2191-1	05/25/22	23:20	19.11	
DCL-DUP01-SPR22	SP2191-2	05/26/22	00:17	19.11	
Continuing Calibrati	WG318723-3	05/26/22	01:14	19.11	
Continuing Calibrati	WG318723-4	06/01/22	11:28	19.11	
Method Blank	WG318787-1	06/01/22	20:15	19.11	
Laboratory Control S	WG318787-2	06/01/22	21:12	19.11	
Laboratory Control S	WG318787-3	06/01/22	22:08	19.11	
LFM-99-05A-SPR22	SP2191-1RE	06/02/22	00:59	19.12	
Continuing Calibrati	WG318723-5	06/02/22	08:29	19.12	



Report of Analytical Results

SDG: SP2191
Lab ID: SP2191-1
Client ID: LFM-99-05A-SPR22
Matrix: AQ
Lab File ID: 2PE10053.D

Sample Date: 05-MAY-22
Extract Date: 17-MAY-22
Extracted By: DL/GM
Extraction Method: MA-VPH
Lab Prep Batch: WG318300

Report Date: 01-JUN-22
Analysis Date: 17-MAY-22
Analyst: DL/GM
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		95.9	%					
2,5-Dibromotoluene (PID)		86.0	%					

Report of Analytical Results

SDG: SP2191
Lab ID: SP2191-2
Client ID: DCL-DUP01-SPR22
Matrix: AQ
Lab File ID: 2PE10054.D

Sample Date: 05-MAY-22
Extract Date: 17-MAY-22
Extracted By: DL/GM
Extraction Method: MA-VPH
Lab Prep Batch: WG318300

Report Date: 01-JUN-22
Analysis Date: 17-MAY-22
Analyst: DL/GM
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		95.4	%					
2,5-Dibromotoluene (PID)		83.8	%					

Report of Analytical Results

SDG: SP2191
Lab ID: WG318300-1
Client ID: Method Blank
Matrix: AQ
Lab File ID: 2PE10048.D

Sample Date: N/A
Extract Date: 17-MAY-22
Extracted By: DL/GM
Extraction Method: MA-VPH
Lab Prep Batch: WG318300

Report Date: 01-JUN-22
Analysis Date: 17-MAY-22
Analyst: DL/GM
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		99.9	%					
2,5-Dibromotoluene (PID)		88.0	%					

Form 2
System Monitoring Compound Recovery

Lab Name: Katahdin Analytical Services

SDG: SP2191

Matrix: AQ

Client Sample ID	Lab Sample ID	Col. ID	DBT-FID #	DBT-PID #
LFM-99-05A-SPR22	SP2191-1	B	95.9	86.0
DCL-DUP01-SPR22	SP2191-2	B	95.4	83.8
Method Blank	WG318300-1	B	99.9	88.0
Laboratory Control S	WG318300-2	B	106.	94.9
Laboratory Control S	WG318300-3	B	106.	95.2

QC Limits

DBT-FID 2,5-DIBROMOTOLUENE (FID)
DBT-PID 2,5-DIBROMOTOLUENE (PID)

70-130
70-130

= Column to be used to flag recovery limits.
* = Values outside of contract required QC limits.
D= System Monitoring Compound diluted out.

LCS/LCSD Recovery Report

LCS ID: WG318300-2
LCSD ID: WG318300-3
SDG: SP2191
LCS File ID: 2PE10049.D

Extract Date: 17-MAY-22
Extracted By: DL/GM
Extraction Method: MA-VPH
Lab Prep Batch: WG318300
LCSD File ID: 2PE10050.D

Analysis Date: 17-MAY-22
Analyst: DL/GM
Analysis Method: MA DEP VPH 04-1.1
Matrix: AQ
Report Date: 20-MAY-22

Compound	Spike Amt	LCS Conc	LCS Rec (%)	LCSD Conc	LCSD Rec (%)	Conc Units	RPD (%)	RPD Limit	Limits
C5-C8 Aliphatics	300.	269.	89.7	258.	86.0	ug/L	4	25	70-130
C9-C12 Aliphatics	200.	204.	102.	205.	102.	ug/L	0	25	70-130
C9-C10 Aromatics	100.	96.6	96.6	97.4	97.4	ug/L	1	25	70-130
Benzene	100.	88.2	88.2	89.6	89.6	ug/L	2	25	70-130
Ethylbenzene	100.	93.2	93.2	94.6	94.6	ug/L	1	25	70-130
Methyl tert-butylether	100.	86.4	86.4	87.2	87.2	ug/L	1	25	70-130
Naphthalene	100.	98.7	98.7	99.7	99.7	ug/L	1	25	70-130
Toluene	100.	90.4	90.4	91.8	91.8	ug/L	2	25	70-130
m+p-Xylenes	200.	183.	91.5	185.	92.5	ug/L	1	25	70-130
o-Xylene	100.	93.8	93.8	94.7	94.7	ug/L	1	25	70-130
2,5-Dibromotoluene (FID)			106.		106.				70-130
2,5-Dibromotoluene (PID)			94.9		95.2				70-130

Form 4 Method Blank Summary

Lab Name : Katahdin Analytical Services
Lab Sample ID : WG318300-1
Lab File ID : 2PE10048.D
Instrument ID : GC02

SDG : SP2191
Date Analyzed : 17-MAY-22
Time Analyzed : 10:01
Date Extracted : 17-MAY-22

This Method Blank applies to the following samples and QC Samples:

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Laboratory Control S	WG318300-2	2PE10049.D	05/17/22	10:41
Laboratory Control S	WG318300-3	2PE10050.D	05/17/22	11:22
LFM-99-05A-SPR22	SP2191-1	2PE10053.D	05/17/22	14:41
DCL-DUP01-SPR22	SP2191-2	2PE10054.D	05/17/22	15:22



Form 8 GC Analytical Sequence

Lab Name : Katahdin Analytical Services
Instrument ID : GC02

SDG : SP2191

Client Sample ID	Lab Sample ID	Date Analyzed	Time Analyzed	DBT (FID)	DBT (PID)
Initial Calibration	WG317688-4	05/03/22	16:12	31.071	
Initial Calibration	WG317688-4	05/03/22	16:12		31.081
Initial Calibration	WG317688-1	05/03/22	16:54	31.078	
Initial Calibration	WG317688-1	05/03/22	16:54		31.087
Initial Calibration	WG317688-2	05/03/22	17:36	31.077	
Initial Calibration	WG317688-2	05/03/22	17:36		31.085
Initial Calibration	WG317688-3	05/03/22	18:19	31.077	
Initial Calibration	WG317688-3	05/03/22	18:19		31.084
Initial Calibration	WG317688-5	05/03/22	19:02	31.075	
Initial Calibration	WG317688-5	05/03/22	19:02		31.088
Initial Calibration	WG317688-6	05/03/22	19:45	31.079	
Initial Calibration	WG317688-6	05/03/22	19:45		31.08
Independent Source	WG317688-7	05/04/22	10:58	31.071	31.082
Continuing Calibrati	WG318300-4	05/17/22	08:55	31.093	31.103
Method Blank	WG318300-1	05/17/22	10:01	31.093	31.103
Laboratory Control S	WG318300-2	05/17/22	10:41	31.093	31.103
Laboratory Control S	WG318300-3	05/17/22	11:22	31.094	31.104
LFM-99-05A-SPR22	SP2191-1	05/17/22	14:41	31.093	31.104
DCL-DUP01-SPR22	SP2191-2	05/17/22	15:22	31.092	31.103
Continuing Calibrati	WG318300-5	05/17/22	16:44	31.096	31.107

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Heather Levesque
669 Marina Drive, Suite B7 Charleston, SC 29492
(819) 370-0374, halevesque@seres-es.com

COC # DCL_SPR22

Boston #215

Project Name: Former Fort Devens, Long Term Monitoring

Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA

Client: Seres-Arcadis JV, Long Term Monitoring, DCL, Spring 2022

Project Number: 30130800

POC: Jerry Lanier, (912) 250-0281, jerry.lanier@et.eurofins.com

Ship to: Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404

WBS Code:

Comments:
A2320B (A) = Alkalinity
E353.2 (A) = Nitrite Nitrate as N
MADEPVP (A) = EPH with PAHs
MADEPVP (A) = VPH with targets
SW6010C (D) = Ba Cd Cr Cu Fe Pb Mn Se Ag
SW7470A (A) = Mercury
SW8081B (A) = Pesticides
SW9012B (A) = Cyanide
SW9056A (A) = Cl SO4



Equipment

Code	Container/Preservative
2	2x 1 Liter amber glass, 1:1 HCl to pH=2; Cool < 6degC
4	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC
5	1x 125mL plastic, Cool < 6degC
6	1x 125mL plastic, Cool < 6degC
9	1x 250mL plastic, HNO3, pH < 2; Cool < 6degC
21	1x 2-1 Liter amber glass, Cool < 6degC
46	1x 250mL plastic, Cool < 6degC
47	1x 500mL amber glass, H2SO4, Cool < 6degC
48	1x 250mL plastic, NaOH to pH > 12; Cool < 6degC
49	1x 500mL plastic, Cool < 6degC

Code	Matrix
WG	Ground Water

Event: Seres-Arcadis JV, Long Term Monitoring, DCL, Spring 2022

Sample ID	Matrix	Date	Time	Samp Init.	Analytical Test Method	Location ID	Sample Type	Depth (ft bgs)		Cooler	Comments
								Top	Bottom		
1	WG				A2320B (A)	LFM-03-07	N1	10.90	20.90	1	
2	WG				E353.2 (A)	LFM-99-02B-SPR22	MS1	14.50	25.83	1	
3	WG				A2540C - TDS	LFM-99-02B-SPR22	N1	14.50	25.83	1	
4	WG				A410.4 - COD	LFM-99-02B-SPR22	SD1	14.50	25.83	1	
5	WG	5-5-22	1014	SG	MADEPVP (A)	LFM-99-05A-SPR22	N1	19.00	29.98	1	
6	WG	5-5-22	1324	SG	MADEPVP (A)	LFM-99-05A-SPR22	FD1	19.00	29.98	1	
7	WG				E410.4 - COD	LFM-99-06A-RP-SPR22	N1	17.50	32.50	1	
8											
9											
10											

Turnaround Time: Standard

Relinquished by: *Yunac Shum*
Date: 5/6/2022
Time: 4:45

Paper 5/5/22 1645
5/7 10:15

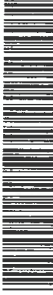
4/13/24
2:4/10
37

Received by:
Date
Time



SP2A1

Chain of Custody Record



Client Information (Sub Contract Lab)		Lab P/M: Lanier, Jerry A		Carrier Tracking No(s): 680-693409.1	
Client Contact: Shipping/Receiving		Phone: Jerry, Lanier@et.eurofinsus.com		Page: Page 1 of 1	
Company: Katahdin Analytical Services		E-Mail: Jerry.Lanier@et.eurofinsus.com		Job #: 680-215136-1	
Address: 600 Technology Way, Scarborough, ME, 04074		Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB		Preservation Codes: M - Hexane N - None O - AsNaO2 P - Na2OAS Q - NaZSO3 R - NaZSO3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4.5 L - EDTA Z - other (specify) Other:	
Due Date Requested: 5/18/2022		Analysis Requested		Total Number of Containers	
TAT Requested (days):		Field Filtered Sample (Yes or No)		SUB (MA VPH + BTEX)/ MA VPH	
PO #:		Perform MS/MSD (Yes or No)		SUB (MA EPH + PAHs)/ MA EPH	
WO #:		Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)			
Project #: 68023801		Sample Type (C=comp, G=grab)			
Site: Fort Devens, DCL, Spring 2022		Preservation Code			
Sample Identification - Client ID (Lab ID)		Sample Date		Sample Time	
LFM-99-05A-SPR22 (680-215136-1)		5/5/22		10:14 Eastern	
DCL-DUP01-SPR22 (680-215136-2)		5/5/22		13:24 Eastern	
<p>Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing Southeast, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Southeast, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Southeast, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Southeast, LLC.</p>					
<p>Possible Hazard Identification</p> <p>Unconfirmed <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For <input type="checkbox"/> Months</p> <p>Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2</p> <p>Empty Kit Relinquished by: _____ Date: _____ Method of Shipment: _____</p> <p>Relinquished by: _____ Date/Time: 5/4/22 11:05 Company: KAS</p> <p>Relinquished by: _____ Date/Time: _____ Company: _____</p> <p>Relinquished by: _____ Date/Time: _____ Company: _____</p> <p>Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Custody Seal No.: _____ Cooler Temperature(s) °C and Other Remarks: _____</p>					



ICOC No:
680-693429

Containers

<u>Count</u>	<u>Container Type</u>
6	Voa Vial 40ml - Hydrochloric Acid

<u>Preservative</u>
Hydrochloric Acid



ICOC No:
680-693409

Containers

<u>Count</u>	<u>Container Type</u>	<u>Preservative</u>
4	Amber Glass 1 liter - unpreserved	None

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Please notify your PM immediately if an error is found in shipment. When returning samples, please return all provided QC samples.

Shipping Order ID: 135886

Page 2 of 3

Printed on 5/9/2022 10:37:48AM

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Bottle Order Information

Bottle Order:
 Bottle Order #: Request From Client: 5/9/2022
 Date Order Posted: Order Status: Ready To Process
 Prepared By: **Deliver By Date: 5/9/2022 11:59:00PM**
 Lab Project Number: PWSID:

Order Completion Information

Creator: Tyler Hartley
 Filled by:
 Sent Date:
 Sent Via:
 Tracking #:

Sets	Bottles/Set	Qty	Bottle Type Description	Preservative	Method	Matrix	Sample Type	Comments	Lot #
------	-------------	-----	-------------------------	--------------	--------	--------	-------------	----------	-------

Notes to Field Staff:



Scan QR code for field sampler instructions

Health and Safety Notes:

Preservative Comment

Relinquished By	Company	Date	Time	Received By	Company	Seal #:
Relinquished By	Company	Date	Time	Received By	Company	Seal #:
						Seal #:
						Seal #:
						Seal #:

Please notify your PM immediately if an error is found in shipment. When returning samples, please return all provided QC samples.



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Katahdin Analytical Services, LLC.

Sample Receipt Condition Report

Client: <i>Eurofins</i>	KAS PM: <i>HMM</i>	Sampled By: <i>Chant</i>
Project:	KIMS Entry By: <i>GN</i>	Delivered By: <i>FedEx</i>
KAS Work Order#: <i>SP2191</i>	KIMS Review By: <i>HMM</i>	Received By: <i>GN</i>
	Labeled By: <i>GN</i>	
SDG #:	Cooler: <u>1</u> of <u>2</u>	Date/Time Rec.: <i>5-10-22/12:10</i>

Receipt Criteria	Y	N	EX*	NA	Comments and/or Resolution
1. Custody seals present / intact?		/			
2. Chain of Custody present in cooler?	✓				
3. Chain of Custody signed by client?	✓				
4. Chain of Custody matches samples?					
5. Temperature Blanks present? If not, take temperature of any sample w/ IR gun.		✓			Temp (°C): <i>5.8</i> Thermometer ID: IR-1
Samples received at <6 °C w/o freezing?	✓				Note: Not required for metals (except Hg soil) analysis.
Ice packs or ice present?	✓				The lack of ice or ice packs (i.e. no attempt to begin cooling process) or insufficient ice may not meet certain regulatory requirements and may invalidate certain data.
If yes, was there sufficient ice to meet temperature requirements?	✓				
If temp. out, has the cooling process begun (i.e. ice or packs present) and sample collection times <6hrs., but samples are not yet cool?				✓	Note: No cooling process required for metals (except Hg soil) analysis.
6. Volatiles: Aqueous: No bubble larger than a pea? Soil/Sediment: Received in airtight container? Received in methanol? Methanol covering soil? D.I. Water - Received within 48 hour HT?	✓				
7. Trip Blank present in cooler?		/			
8. Proper sample containers and volume?	/				
9. Samples within hold time upon receipt?	/				
10. Aqueous samples properly preserved? Metals, COD, NH3, TKN, O/G, phenol, TPO4, N+N, TOC, DRO, TPH – pH <2 Sulfide - >9 Cyanide – pH >12		/			
11. Bottleneck Prepped on:					
* Log-In Notes to Exceptions: document any problems with samples or discrepancies or pH adjustments.					

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Katahdin Analytical Services, LLC.

Sample Receipt Condition Report

Client: <i>Eurofins</i>	KAS PM: <i>HHM</i>	Sampled By: <i>Chant</i>
Project:	KIMS Entry By: <i>GN</i>	Delivered By: <i>FedEx</i>
KAS Work Order#: <i>SP2191</i>	KIMS Review By: <i>HHM</i>	Received By: <i>GN</i>
	Labeled By: <i>GN</i>	
SDG #:	Cooler: <u>2</u> of <u>2</u>	Date/Time Rec.: <i>5-10-22/12:10</i>

Receipt Criteria	Y	N	EX*	NA	Comments and/or Resolution
1. Custody seals present / intact?		/			
2. Chain of Custody present in cooler?	✓				
3. Chain of Custody signed by client?	✓				
4. Chain of Custody matches samples?					
5. Temperature Blanks present? If not, take temperature of any sample w/ IR gun.		/			Temp (°C): <i>5.4</i> Thermometer ID: IR-1
Samples received at <6 °C w/o freezing?	✓				Note: Not required for metals (except Hg soil) analysis.
Ice packs or ice present?	/				The lack of ice or ice packs (i.e. no attempt to begin cooling process) or insufficient ice may not meet certain regulatory requirements and may invalidate certain data.
If yes, was there sufficient ice to meet temperature requirements?	/				
If temp. out, has the cooling process begun (i.e. ice or packs present) and sample collection times <6hrs., but samples are not yet cool?				/	Note: No cooling process required for metals (except Hg soil) analysis.
6. Volatiles: Aqueous: No bubble larger than a pea? Soil/Sediment: Received in airtight container? Received in methanol? Methanol covering soil? D.I. Water - Received within 48 hour HT?	/			/	<i>headspace in vials -1</i>
7. Trip Blank present in cooler?		/			
8. Proper sample containers and volume?	/				
9. Samples within hold time upon receipt?	/				
10. Aqueous samples properly preserved? Metals, COD, NH3, TKN, O/G, phenol, TPO4, N+N, TOC, DRO, TPH - pH <2 Sulfide - >9 Cyanide - pH >12	/	✓		/	
11. Bottleneck Prepped on:					

* Log-In Notes to Exceptions: document any problems with samples or discrepancies or pH adjustments.

1 Amber Dup arrived broken

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-215136-1

Login Number: 215136

List Number: 1

Creator: Padayao, Abigail

List Source: Eurofins Savannah

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-215136-1

Login Number: 215136

List Number: 2

Creator: Lee, Jerry

List Source: Eurofins Denver

List Creation: 05/10/22 06:50 PM

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



ANALYTICAL REPORT

Eurofins Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-215078-1
Client Project/Site: Fort Devens DCL Spring 2022

For:

Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Attn: Heather Levesque



Authorized for release by:
6/30/2022 2:33:34 PM

Jerry Lanier, Project Manager I
(912)250-0281
Jerry.Lanier@et.eurofinsus.com

LINKS

Review your project
results through



Have a Question?



Visit us at:

www.eurofinsus.com/Env

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

HPLC/IC

Qualifier	Qualifier Description
D	The reported value is from a dilution.
U	Undetected at the Limit of Detection.

Metals

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U	Undetected at the Limit of Detection.

General Chemistry

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)

Eurofins Savannah

Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

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Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-215078-1	LFM-03-07-SPR22	Water	05/04/22 09:30	05/06/22 10:40
680-215078-2	LFM-99-02B-SPR22	Water	05/04/22 10:50	05/06/22 10:40
680-215078-3	LFM-99-06A-RP-SPR22	Water	05/04/22 12:05	05/06/22 10:40

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Case Narrative

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Job ID: 680-215078-1

Laboratory: Eurofins Savannah

Narrative

Job Narrative 680-215078-1

Comments

No additional comments.

Receipt

The samples were received on 5/6/2022 10:40 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 4 coolers at receipt time were 2.3° C, 2.8° C, 3.3° C and 4.6° C.

HPLC/IC

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA

Method 8081B 8082A: Surrogate recovery was outside acceptance limits for the following matrix spike (MS) sample: LFM-99-02B-SPR22 (680-215078-2[MS]). The parent sample's surrogate recovery was within limits. The MS sample has been qualified and reported.

Method 8081B 8082A: The closing continuing calibration verification (CCV) associated with batch 680-720533 recovered above the upper control limit for Endrin ketone and Toxaphene. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data has been reported. The associated samples are impacted: LFM-03-07-SPR22 (680-215078-1), LFM-99-02B-SPR22 (680-215078-2) and LFM-99-06A-RP-SPR22 (680-215078-3).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

Method 410.4: The matrix spike / matrix spike duplicate (MS/MSD) recoveries and precision for analytical batch 280-575212 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample / laboratory sample control duplicate (LCS/LCSD) precision was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Client Sample ID: LFM-03-07-SPR22

Lab Sample ID: 680-215078-1

Date Collected: 05/04/22 09:30

Matrix: Water

Date Received: 05/06/22 10:40

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
4,4'-DDD	0.0072	U	0.024	0.0072	0.0031	ug/L		05/12/22 18:35	1
4,4'-DDE	0.0072	U M	0.024	0.0072	0.0025	ug/L		05/12/22 18:35	1
4,4'-DDT	0.0072	U	0.024	0.0072	0.0034	ug/L		05/12/22 18:35	1
Aldrin	0.0072	U M	0.024	0.0072	0.0035	ug/L		05/12/22 18:35	1
alpha-BHC	0.0048	U	0.024	0.0048	0.0016	ug/L		05/12/22 18:35	1
beta-BHC	0.0096	U	0.024	0.0096	0.0044	ug/L		05/12/22 18:35	1
Chlordane (technical)	0.13	U	0.24	0.13	0.046	ug/L		05/12/22 18:35	1
delta-BHC	0.0096	U	0.024	0.0096	0.0037	ug/L		05/12/22 18:35	1
Dieldrin	0.0048	U	0.024	0.0048	0.0018	ug/L		05/12/22 18:35	1
Endosulfan I	0.0048	U	0.024	0.0048	0.0017	ug/L		05/12/22 18:35	1
Endosulfan II	0.0048	U	0.024	0.0048	0.0020	ug/L		05/12/22 18:35	1
Endosulfan sulfate	0.0072	U	0.024	0.0072	0.0025	ug/L		05/12/22 18:35	1
Endrin	0.0072	U	0.024	0.0072	0.0026	ug/L		05/12/22 18:35	1
Endrin aldehyde	0.0072	U M	0.024	0.0072	0.0030	ug/L		05/12/22 18:35	1
Endrin ketone	0.0048	U M Q	0.024	0.0048	0.0022	ug/L		05/12/22 18:35	1
gamma-BHC (Lindane)	0.0048	U	0.024	0.0048	0.0017	ug/L		05/12/22 18:35	1
Heptachlor	0.0072	U	0.024	0.0072	0.0035	ug/L		05/12/22 18:35	1
Heptachlor epoxide	0.0048	U	0.024	0.0048	0.0018	ug/L		05/12/22 18:35	1
Methoxychlor	0.0096	U	0.024	0.0096	0.0047	ug/L		05/12/22 18:35	1
Toxaphene	0.54	U Q	2.4	0.54	0.19	ug/L		05/12/22 18:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	47		14 - 130	05/11/22 18:35	05/12/22 18:35	1
Tetrachloro-m-xylene	57		44 - 124	05/11/22 18:35	05/12/22 18:35	1

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chloride	190	D	2.5	2.5	1.0	mg/L		05/19/22 16:27	5
Sulfate	24	D	5.0	5.0	2.0	mg/L		05/19/22 16:27	5

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	12	J	20	10	4.4	ug/L		05/14/22 22:28	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		05/14/22 22:28	1
Chromium	5.0	U	10	5.0	1.1	ug/L		05/14/22 22:28	1
Copper	10	U	20	10	3.2	ug/L		05/14/22 22:28	1
Iron	45	J	100	50	20	ug/L		05/14/22 22:28	1
Lead	10	U	40	10	6.6	ug/L		05/14/22 22:28	1
Manganese	5.0	U	10	5.0	1.3	ug/L		05/14/22 22:28	1
Selenium	20	U	25	20	10	ug/L		05/14/22 22:28	1
Silver	5.0	U	10	5.0	1.5	ug/L		05/14/22 22:28	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		05/11/22 14:16	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		05/11/22 11:16	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Client Sample ID: LFM-03-07-SPR22

Lab Sample ID: 680-215078-1

Date Collected: 05/04/22 09:30

Matrix: Water

Date Received: 05/06/22 10:40

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity	97		5.0	5.0	5.0	mg/L		05/11/22 22:03	1
Nitrate/Nitrite-N	1.3		0.10	0.050	0.044	mg/L		05/16/22 18:24	1
Chemical Oxygen Demand	20	U	20	20	8.7	mg/L		05/17/22 11:46	1
Cyanide, Total	0.0091	J	0.010	0.0050	0.0025	mg/L		05/13/22 14:59	1
Total Dissolved Solids (TDS)	460		10	9.9	4.7	mg/L		05/11/22 10:11	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Client Sample ID: LFM-99-02B-SPR22

Lab Sample ID: 680-215078-2

Date Collected: 05/04/22 10:50

Matrix: Water

Date Received: 05/06/22 10:40

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
4,4'-DDD	0.0074	U	0.025	0.0074	0.0031	ug/L		05/12/22 18:49	1
4,4'-DDE	0.0074	U M J1	0.025	0.0074	0.0025	ug/L		05/12/22 18:49	1
4,4'-DDT	0.0074	U	0.025	0.0074	0.0034	ug/L		05/12/22 18:49	1
Aldrin	0.0074	U J1	0.025	0.0074	0.0035	ug/L		05/12/22 18:49	1
alpha-BHC	0.0049	U J1	0.025	0.0049	0.0017	ug/L		05/12/22 18:49	1
beta-BHC	0.0098	U	0.025	0.0098	0.0045	ug/L		05/12/22 18:49	1
Chlordane (technical)	0.14	U M	0.25	0.14	0.047	ug/L		05/12/22 18:49	1
delta-BHC	0.0098	U	0.025	0.0098	0.0037	ug/L		05/12/22 18:49	1
Dieldrin	0.0049	U	0.025	0.0049	0.0019	ug/L		05/12/22 18:49	1
Endosulfan I	0.0049	U J1	0.025	0.0049	0.0018	ug/L		05/12/22 18:49	1
Endosulfan II	0.0049	U	0.025	0.0049	0.0021	ug/L		05/12/22 18:49	1
Endosulfan sulfate	0.0074	U M	0.025	0.0074	0.0025	ug/L		05/12/22 18:49	1
Endrin	0.0074	U J1	0.025	0.0074	0.0026	ug/L		05/12/22 18:49	1
Endrin aldehyde	0.0074	U M	0.025	0.0074	0.0030	ug/L		05/12/22 18:49	1
Endrin ketone	0.0049	U M Q	0.025	0.0049	0.0023	ug/L		05/12/22 18:49	1
gamma-BHC (Lindane)	0.0049	U J1	0.025	0.0049	0.0018	ug/L		05/12/22 18:49	1
Heptachlor	0.0074	U J1	0.025	0.0074	0.0035	ug/L		05/12/22 18:49	1
Heptachlor epoxide	0.0049	U J1	0.025	0.0049	0.0019	ug/L		05/12/22 18:49	1
Methoxychlor	0.0098	U M	0.025	0.0098	0.0048	ug/L		05/12/22 18:49	1
Toxaphene	0.55	U Q	2.5	0.55	0.20	ug/L		05/12/22 18:49	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	47		14 - 130	05/11/22 18:35	05/12/22 18:49	1
Tetrachloro-m-xylene	46		44 - 124	05/11/22 18:35	05/12/22 18:49	1

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chloride	170	D	2.5	2.5	1.0	mg/L		05/19/22 14:33	5
Sulfate	12	D	5.0	5.0	2.0	mg/L		05/19/22 14:33	5

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	72	J1	20	10	4.4	ug/L		05/14/22 22:18	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		05/14/22 22:18	1
Chromium	5.0	U	10	5.0	1.1	ug/L		05/14/22 22:18	1
Copper	10	U	20	10	3.2	ug/L		05/14/22 22:18	1
Iron	50	U	100	50	20	ug/L		05/14/22 22:18	1
Lead	10	U	40	10	6.6	ug/L		05/14/22 22:18	1
Manganese	5.0	U	10	5.0	1.3	ug/L		05/14/22 22:18	1
Selenium	20	U	25	20	10	ug/L		05/14/22 22:18	1
Silver	5.0	U	10	5.0	1.5	ug/L		05/14/22 22:18	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		05/11/22 14:03	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U J1	0.25	0.20	0.080	ug/L		05/11/22 11:19	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Client Sample ID: LFM-99-02B-SPR22

Lab Sample ID: 680-215078-2

Date Collected: 05/04/22 10:50

Matrix: Water

Date Received: 05/06/22 10:40

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity	69		5.0	5.0	5.0	mg/L		05/11/22 22:10	1
Nitrate/Nitrite-N	0.38		0.10	0.050	0.044	mg/L		05/16/22 18:28	1
Chemical Oxygen Demand	10	J J1	20	20	8.7	mg/L		05/17/22 11:46	1
Cyanide, Total	0.0074	J	0.010	0.0050	0.0025	mg/L		05/13/22 14:59	1
Total Dissolved Solids (TDS)	370		10	9.9	4.7	mg/L		05/11/22 10:11	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Client Sample ID: LFM-99-06A-RP-SPR22

Lab Sample ID: 680-215078-3

Date Collected: 05/04/22 12:05

Matrix: Water

Date Received: 05/06/22 10:40

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
4,4'-DDD	0.0074	U M	0.025	0.0074	0.0032	ug/L		05/12/22 19:04	1
4,4'-DDE	0.0074	U M	0.025	0.0074	0.0026	ug/L		05/12/22 19:04	1
4,4'-DDT	0.0074	U	0.025	0.0074	0.0035	ug/L		05/12/22 19:04	1
Aldrin	0.0074	U M	0.025	0.0074	0.0036	ug/L		05/12/22 19:04	1
alpha-BHC	0.0050	U	0.025	0.0050	0.0017	ug/L		05/12/22 19:04	1
beta-BHC	0.0099	U	0.025	0.0099	0.0046	ug/L		05/12/22 19:04	1
Chlordane (technical)	0.14	U M	0.25	0.14	0.048	ug/L		05/12/22 19:04	1
delta-BHC	0.0099	U	0.025	0.0099	0.0038	ug/L		05/12/22 19:04	1
Dieldrin	0.0050	U	0.025	0.0050	0.0019	ug/L		05/12/22 19:04	1
Endosulfan I	0.0050	U	0.025	0.0050	0.0018	ug/L		05/12/22 19:04	1
Endosulfan II	0.0050	U M	0.025	0.0050	0.0021	ug/L		05/12/22 19:04	1
Endosulfan sulfate	0.0074	U	0.025	0.0074	0.0026	ug/L		05/12/22 19:04	1
Endrin	0.0074	U	0.025	0.0074	0.0027	ug/L		05/12/22 19:04	1
Endrin aldehyde	0.0074	U	0.025	0.0074	0.0031	ug/L		05/12/22 19:04	1
Endrin ketone	0.0050	U M Q	0.025	0.0050	0.0023	ug/L		05/12/22 19:04	1
gamma-BHC (Lindane)	0.0050	U	0.025	0.0050	0.0018	ug/L		05/12/22 19:04	1
Heptachlor	0.0074	U	0.025	0.0074	0.0036	ug/L		05/12/22 19:04	1
Heptachlor epoxide	0.0050	U	0.025	0.0050	0.0019	ug/L		05/12/22 19:04	1
Methoxychlor	0.0099	U	0.025	0.0099	0.0049	ug/L		05/12/22 19:04	1
Toxaphene	0.56	U Q	2.5	0.56	0.20	ug/L		05/12/22 19:04	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	61		14 - 130	05/11/22 18:35	05/12/22 19:04	1
Tetrachloro-m-xylene	57		44 - 124	05/11/22 18:35	05/12/22 19:04	1

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chloride	220	D	2.5	2.5	1.0	mg/L		05/19/22 16:39	5
Sulfate	23	D	5.0	5.0	2.0	mg/L		05/19/22 16:39	5

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	5.0	J	20	10	4.4	ug/L		05/14/22 22:43	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		05/14/22 22:43	1
Chromium	5.0	U	10	5.0	1.1	ug/L		05/14/22 22:43	1
Copper	10	U	20	10	3.2	ug/L		05/14/22 22:43	1
Iron	50	U	100	50	20	ug/L		05/14/22 22:43	1
Lead	10	U	40	10	6.6	ug/L		05/14/22 22:43	1
Manganese	5.0	U	10	5.0	1.3	ug/L		05/14/22 22:43	1
Selenium	20	U	25	20	10	ug/L		05/14/22 22:43	1
Silver	5.0	U	10	5.0	1.5	ug/L		05/14/22 22:43	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		05/11/22 14:19	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		05/11/22 11:26	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Client Sample ID: LFM-99-06A-RP-SPR22

Lab Sample ID: 680-215078-3

Date Collected: 05/04/22 12:05

Matrix: Water

Date Received: 05/06/22 10:40

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity	89		5.0	5.0	5.0	mg/L		05/12/22 18:47	1
Nitrate/Nitrite-N	0.90		0.10	0.050	0.044	mg/L		05/16/22 18:26	1
Chemical Oxygen Demand	20	U	20	20	8.7	mg/L		05/17/22 11:46	1
Cyanide, Total	0.0070	J	0.010	0.0050	0.0025	mg/L		05/13/22 14:59	1
Total Dissolved Solids (TDS)	500		10	9.9	4.7	mg/L		05/11/22 10:11	1

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Lab Sample ID: MB 680-720300/8-A
Matrix: Water
Analysis Batch: 720533

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 720300

Analyte	MB MB		LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
4,4'-DDD	0.0075	U	0.025	0.0075	0.0032	ug/L		05/12/22 17:38	1
4,4'-DDE	0.0075	U M	0.025	0.0075	0.0026	ug/L		05/12/22 17:38	1
4,4'-DDT	0.0075	U	0.025	0.0075	0.0035	ug/L		05/12/22 17:38	1
Aldrin	0.0075	U M	0.025	0.0075	0.0036	ug/L		05/12/22 17:38	1
alpha-BHC	0.0050	U	0.025	0.0050	0.0017	ug/L		05/12/22 17:38	1
beta-BHC	0.010	U	0.025	0.010	0.0046	ug/L		05/12/22 17:38	1
Chlordane (technical)	0.14	U M	0.25	0.14	0.048	ug/L		05/12/22 17:38	1
delta-BHC	0.010	U	0.025	0.010	0.0038	ug/L		05/12/22 17:38	1
Dieldrin	0.0050	U	0.025	0.0050	0.0019	ug/L		05/12/22 17:38	1
Endosulfan I	0.0050	U	0.025	0.0050	0.0018	ug/L		05/12/22 17:38	1
Endosulfan II	0.0050	U	0.025	0.0050	0.0021	ug/L		05/12/22 17:38	1
Endosulfan sulfate	0.0075	U	0.025	0.0075	0.0026	ug/L		05/12/22 17:38	1
Endrin	0.0075	U	0.025	0.0075	0.0027	ug/L		05/12/22 17:38	1
Endrin aldehyde	0.0075	U M	0.025	0.0075	0.0031	ug/L		05/12/22 17:38	1
Endrin ketone	0.0050	U M	0.025	0.0050	0.0023	ug/L		05/12/22 17:38	1
gamma-BHC (Lindane)	0.0050	U	0.025	0.0050	0.0018	ug/L		05/12/22 17:38	1
Heptachlor	0.0075	U	0.025	0.0075	0.0036	ug/L		05/12/22 17:38	1
Heptachlor epoxide	0.0050	U	0.025	0.0050	0.0019	ug/L		05/12/22 17:38	1
Methoxychlor	0.010	U	0.025	0.010	0.0049	ug/L		05/12/22 17:38	1
Toxaphene	0.56	U	2.5	0.56	0.20	ug/L		05/12/22 17:38	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
DCB Decachlorobiphenyl	96		14 - 130	05/11/22 18:35	05/12/22 17:38	1
Tetrachloro-m-xylene	57		44 - 124	05/11/22 18:35	05/12/22 17:38	1

Lab Sample ID: LCS 680-720300/9-A
Matrix: Water
Analysis Batch: 720533

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 720300

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
4,4'-DDE	0.0500	0.0367		ug/L		73	57 - 135
4,4'-DDT	0.0500	0.0467		ug/L		93	51 - 143
Aldrin	0.0500	0.0275		ug/L		55	45 - 134
alpha-BHC	0.0500	0.0372		ug/L		74	54 - 138
beta-BHC	0.0500	0.0392		ug/L		78	56 - 136
delta-BHC	0.0500	0.0438		ug/L		88	52 - 142
Dieldrin	0.0500	0.0445		ug/L		89	60 - 136
Endosulfan I	0.0500	0.0437		ug/L		87	62 - 126
Endosulfan II	0.0500	0.0448		ug/L		90	52 - 135
Endosulfan sulfate	0.0500	0.0502		ug/L		100	62 - 133
Endrin	0.0500	0.0454		ug/L		91	60 - 138
Endrin aldehyde	0.0500	0.0498		ug/L		100	51 - 132
Endrin ketone	0.0500	0.0523		ug/L		105	58 - 134
gamma-BHC (Lindane)	0.0500	0.0376		ug/L		75	59 - 134
Heptachlor	0.0500	0.0300		ug/L		60	54 - 130
Heptachlor epoxide	0.0500	0.0406		ug/L		81	61 - 133
Methoxychlor	0.0500	0.0509		ug/L		102	54 - 145

Eurofins Savannah

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC) (Continued)

Lab Sample ID: LCS 680-720300/9-A

Matrix: Water

Analysis Batch: 720533

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 720300

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
DCB Decachlorobiphenyl	81		14 - 130
Tetrachloro-m-xylene	56		44 - 124

Lab Sample ID: 680-215078-2 MS

Matrix: Water

Analysis Batch: 720533

Client Sample ID: LFM-99-02B-SPR22

Prep Type: Total/NA

Prep Batch: 720300

Analyte	Sample	Sample	Spike	MS MS		Unit	D	%Rec	%Rec	Limits
	Result	Qualifier		Result	Qualifier					
4,4'-DDD	0.0074	U	0.0488	0.0356		ug/L		73	56 - 143	
4,4'-DDE	0.0074	U M J1	0.0488	0.0260	J1	ug/L		53	57 - 135	
4,4'-DDT	0.0074	U	0.0488	0.0376		ug/L		77	51 - 143	
Aldrin	0.0074	U J1	0.0488	0.0203	J J1	ug/L		42	45 - 134	
alpha-BHC	0.0049	U J1	0.0488	0.0254	J1	ug/L		52	54 - 138	
beta-BHC	0.0098	U	0.0488	0.0325		ug/L		67	56 - 136	
delta-BHC	0.0098	U	0.0488	0.0344		ug/L		71	52 - 142	
Dieldrin	0.0049	U	0.0488	0.0315		ug/L		65	60 - 136	
Endosulfan I	0.0049	U J1	0.0488	0.0308		ug/L		63	62 - 126	
Endosulfan II	0.0049	U	0.0488	0.0354		ug/L		73	52 - 135	
Endosulfan sulfate	0.0074	U M	0.0488	0.0396		ug/L		81	62 - 133	
Endrin	0.0074	U J1	0.0488	0.0347		ug/L		71	60 - 138	
Endrin aldehyde	0.0074	U M	0.0488	0.0368		ug/L		75	51 - 132	
Endrin ketone	0.0049	U M Q	0.0488	0.0603		ug/L		124	58 - 134	
gamma-BHC (Lindane)	0.0049	U J1	0.0488	0.0261	J1	ug/L		54	59 - 134	
Heptachlor	0.0074	U J1	0.0488	0.0223	J J1	ug/L		46	54 - 130	
Heptachlor epoxide	0.0049	U J1	0.0488	0.0295		ug/L		61	61 - 133	
Methoxychlor	0.0098	U M	0.0488	0.0410		ug/L		84	54 - 145	

Surrogate	MS MS		Limits
	%Recovery	Qualifier	
DCB Decachlorobiphenyl	52		14 - 130
Tetrachloro-m-xylene	40	Q	44 - 124

Lab Sample ID: 680-215078-2 MSD

Matrix: Water

Analysis Batch: 720533

Client Sample ID: LFM-99-02B-SPR22

Prep Type: Total/NA

Prep Batch: 720300

Analyte	Sample	Sample	Spike	MSD MSD		Unit	D	%Rec	%Rec	Limits	RPD	Limit
	Result	Qualifier		Result	Qualifier							
4,4'-DDD	0.0074	U	0.0488	0.0415		ug/L		85	56 - 143	15	30	
4,4'-DDE	0.0074	U M J1	0.0488	0.0365	J1	ug/L		75	57 - 135	33	30	
4,4'-DDT	0.0074	U	0.0488	0.0465		ug/L		95	51 - 143	21	30	
Aldrin	0.0074	U J1	0.0488	0.0294	J1	ug/L		60	45 - 134	37	30	
alpha-BHC	0.0049	U J1	0.0488	0.0351	J1	ug/L		72	54 - 138	32	30	
beta-BHC	0.0098	U	0.0488	0.0409		ug/L		84	56 - 136	23	30	
delta-BHC	0.0098	U	0.0488	0.0424		ug/L		87	52 - 142	21	30	
Dieldrin	0.0049	U	0.0488	0.0404		ug/L		83	60 - 136	25	30	
Endosulfan I	0.0049	U J1	0.0488	0.0401		ug/L		82	62 - 126	26	30	
Endosulfan II	0.0049	U	0.0488	0.0420		ug/L		86	52 - 135	17	30	
Endosulfan sulfate	0.0074	U M	0.0488	0.0484		ug/L		99	62 - 133	20	30	
Endrin	0.0074	U J1	0.0488	0.0421		ug/L		86	60 - 138	19	30	

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC) (Continued)

Lab Sample ID: 680-215078-2 MSD

Matrix: Water

Analysis Batch: 720533

Client Sample ID: LFM-99-02B-SPR22

Prep Type: Total/NA

Prep Batch: 720300

Analyte	Sample	Sample	Spike Added	MSD	MSD	Unit	D	%Rec	%Rec	RPD	Limit
	Result	Qualifier		Result	Qualifier				Limits		
Endrin aldehyde	0.0074	U M	0.0488	0.0454		ug/L		93	51 - 132	21	30
Endrin ketone	0.0049	U M Q	0.0488	0.0502		ug/L		103	58 - 134	18	30
gamma-BHC (Lindane)	0.0049	U J1	0.0488	0.0359	J1	ug/L		74	59 - 134	32	30
Heptachlor	0.0074	U J1	0.0488	0.0308	J1	ug/L		63	54 - 130	32	30
Heptachlor epoxide	0.0049	U J1	0.0488	0.0398		ug/L		81	61 - 133	30	30
Methoxychlor	0.0098	U M	0.0488	0.0473		ug/L		97	54 - 145	14	30
MSD MSD											
Surrogate	%Recovery	Qualifier	Limits								
DCB Decachlorobiphenyl	63		14 - 130								
Tetrachloro-m-xylene	58		44 - 124								

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 680-721624/2

Matrix: Water

Analysis Batch: 721624

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB	MB	LOQ	LOD	DL	Unit	D	Analyzed	Dil	Fac
	Result	Qualifier								
Chloride	0.50	U	0.50	0.50	0.20	mg/L		05/19/22 10:28		1
Sulfate	1.0	U	1.0	1.0	0.40	mg/L		05/19/22 10:28		1

Lab Sample ID: LCS 680-721624/3

Matrix: Water

Analysis Batch: 721624

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec	RPD	Limit
		Result	Qualifier				Limits		
Chloride	10.0	10.0		mg/L		100	87 - 111		
Sulfate	10.0	9.42		mg/L		94	87 - 112		

Lab Sample ID: LCSD 680-721624/4

Matrix: Water

Analysis Batch: 721624

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD	LCSD	Unit	D	%Rec	%Rec	RPD	Limit
		Result	Qualifier				Limits		
Chloride	10.0	10.0		mg/L		100	87 - 111	0	15
Sulfate	10.0	9.61		mg/L		96	87 - 112	2	15

Lab Sample ID: 680-215078-2 MS

Matrix: Water

Analysis Batch: 721624

Client Sample ID: LFM-99-02B-SPR22

Prep Type: Total/NA

Analyte	Sample	Sample	Spike Added	MS	MS	Unit	D	%Rec	%Rec	RPD	Limit
	Result	Qualifier		Result	Qualifier				Limits		
Chloride	170	D	50.0	213	D	mg/L		94	87 - 111		
Sulfate	12	D	50.0	61.4	D	mg/L		99	87 - 112		

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: 680-215078-2 MSD
 Matrix: Water
 Analysis Batch: 721624

Client Sample ID: LFM-99-02B-SPR22
 Prep Type: Total/NA

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec	RPD	Limit
	Result	Qualifier	Added	Result	Qualifier				Limits		
Chloride	170	D	50.0	212	D	mg/L		92	87 - 111	1	15
Sulfate	12	D	50.0	61.4	D	mg/L		99	87 - 112	0	15

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-720064/1-A
 Matrix: Water
 Analysis Batch: 720882

Client Sample ID: Method Blank
 Prep Type: Total Recoverable
 Prep Batch: 720064

Analyte	MB	MB	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Barium	10	U	20	10	4.4	ug/L		05/14/22 22:12	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		05/14/22 22:12	1
Chromium	5.0	U	10	5.0	1.1	ug/L		05/14/22 22:12	1
Copper	3.33	J	20	10	3.2	ug/L		05/14/22 22:12	1
Iron	50	U	100	50	20	ug/L		05/14/22 22:12	1
Lead	10	U	40	10	6.6	ug/L		05/14/22 22:12	1
Manganese	5.0	U	10	5.0	1.3	ug/L		05/14/22 22:12	1
Selenium	20	U	25	20	10	ug/L		05/14/22 22:12	1
Silver	5.0	U	10	5.0	1.5	ug/L		05/14/22 22:12	1

Lab Sample ID: LCS 680-720064/2-A
 Matrix: Water
 Analysis Batch: 720882

Client Sample ID: Lab Control Sample
 Prep Type: Total Recoverable
 Prep Batch: 720064

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec
		Result	Qualifier				Limits
Barium	100	101		ug/L		101	88 - 113
Cadmium	50.0	50.9		ug/L		102	88 - 113
Chromium	100	103		ug/L		103	90 - 113
Copper	99.1	103		ug/L		104	86 - 114
Iron	5000	5000		ug/L		100	87 - 115
Lead	505	506		ug/L		100	86 - 113
Manganese	400	402		ug/L		100	90 - 114
Selenium	100	100		ug/L		100	83 - 114
Silver	50.0	50.9		ug/L		102	84 - 115

Lab Sample ID: 680-215078-2 MS
 Matrix: Water
 Analysis Batch: 720882

Client Sample ID: LFM-99-02B-SPR22
 Prep Type: Total Recoverable
 Prep Batch: 720064

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec
	Result	Qualifier	Added	Result	Qualifier				Limits
Barium	72	J1	100	107	J1	ug/L		35	88 - 113
Cadmium	1.0	U	50.0	50.6		ug/L		101	88 - 113
Chromium	5.0	U	100	103		ug/L		103	90 - 113
Copper	10	U	99.1	108		ug/L		109	86 - 114
Iron	50	U	5000	4940		ug/L		99	87 - 115
Lead	10	U	505	501		ug/L		99	86 - 113
Manganese	5.0	U	400	399		ug/L		100	90 - 114
Selenium	20	U	100	102		ug/L		102	83 - 114
Silver	5.0	U	50.0	51.3		ug/L		103	84 - 115

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: 680-215078-2 MSD
 Matrix: Water
 Analysis Batch: 720882

Client Sample ID: LFM-99-02B-SPR22
 Prep Type: Total Recoverable
 Prep Batch: 720064

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec	RPD	Limit
	Result	Qualifier	Added	Result	Qualifier				Limits		
Barium	72	J1	100	109	J1	ug/L		37	88 - 113	2	20
Cadmium	1.0	U	50.0	51.8		ug/L		104	88 - 113	2	20
Chromium	5.0	U	100	105		ug/L		105	90 - 113	2	20
Copper	10	U	99.1	110		ug/L		111	86 - 114	2	20
Iron	50	U	5000	5050		ug/L		101	87 - 115	2	20
Lead	10	U	505	511		ug/L		101	86 - 113	2	20
Manganese	5.0	U	400	406		ug/L		101	90 - 114	2	20
Selenium	20	U	100	107		ug/L		106	83 - 114	4	20
Silver	5.0	U	50.0	52.4		ug/L		105	84 - 115	2	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 680-720079/1-A
 Matrix: Water
 Analysis Batch: 720457

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 720079

Analyte	MB	MB	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		05/11/22 13:58	1

Lab Sample ID: LCS 680-720079/2-A
 Matrix: Water
 Analysis Batch: 720457

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 720079

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec
		Result	Qualifier				Limits
Arsenic	100	97.1		ug/L		97	84 - 116

Lab Sample ID: 680-215078-2 MS
 Matrix: Water
 Analysis Batch: 720457

Client Sample ID: LFM-99-02B-SPR22
 Prep Type: Total/NA
 Prep Batch: 720079

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec
	Result	Qualifier	Added	Result	Qualifier				Limits
Arsenic	3.0	U	100	105		ug/L		105	84 - 116

Lab Sample ID: 680-215078-2 MSD
 Matrix: Water
 Analysis Batch: 720457

Client Sample ID: LFM-99-02B-SPR22
 Prep Type: Total/NA
 Prep Batch: 720079

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec	RPD	Limit
	Result	Qualifier	Added	Result	Qualifier				Limits		
Arsenic	3.0	U	100	102		ug/L		102	84 - 116	2	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 680-720105/12-A
 Matrix: Water
 Analysis Batch: 720363

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 720105

Analyte	MB	MB	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Mercury	0.20	U	0.25	0.20	0.080	ug/L		05/11/22 11:11	1

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 680-720105/13-A
 Matrix: Water
 Analysis Batch: 720363

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 720105

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.50	2.50		ug/L		100	80 - 124

Lab Sample ID: 680-215078-2 MS
 Matrix: Water
 Analysis Batch: 720363

Client Sample ID: LFM-99-02B-SPR22
 Prep Type: Total/NA
 Prep Batch: 720105

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.20	U J1	1.00	0.795		ug/L		80	80 - 124

Lab Sample ID: 680-215078-2 MSD
 Matrix: Water
 Analysis Batch: 720363

Client Sample ID: LFM-99-02B-SPR22
 Prep Type: Total/NA
 Prep Batch: 720105

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	0.20	U J1	1.00	0.793	J1	ug/L		79	80 - 124	0	20

Method: 2320B-2011 - Alkalinity, Total

Lab Sample ID: MB 680-720385/34
 Matrix: Water
 Analysis Batch: 720385

Client Sample ID: Method Blank
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity	5.0	U	5.0	5.0	5.0	mg/L		05/11/22 20:51	1

Lab Sample ID: LCS 680-720385/36
 Matrix: Water
 Analysis Batch: 720385

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Alkalinity	250	235		mg/L		94	90 - 112

Lab Sample ID: LCSD 680-720385/61
 Matrix: Water
 Analysis Batch: 720385

Client Sample ID: Lab Control Sample Dup
 Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Alkalinity	250	237		mg/L		95	90 - 112	1	30

Lab Sample ID: MB 680-720621/5
 Matrix: Water
 Analysis Batch: 720621

Client Sample ID: Method Blank
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity	5.0	U	5.0	5.0	5.0	mg/L		05/12/22 17:00	1

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Method: 2320B-2011 - Alkalinity, Total (Continued)

Lab Sample ID: LCS 680-720621/7
 Matrix: Water
 Analysis Batch: 720621

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Alkalinity	250	236		mg/L		94	90 - 112

Lab Sample ID: LCSD 680-720621/32
 Matrix: Water
 Analysis Batch: 720621

Client Sample ID: Lab Control Sample Dup
 Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Alkalinity	250	238		mg/L		95	90 - 112	1	30

Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 280-575145/62
 Matrix: Water
 Analysis Batch: 575145

Client Sample ID: Method Blank
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Nitrate/Nitrite-N	0.050	U	0.10	0.050	0.044	mg/L		05/16/22 17:52	1

Lab Sample ID: LCS 280-575145/60
 Matrix: Water
 Analysis Batch: 575145

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate/Nitrite-N	5.00	5.12		mg/L		102	90 - 110

Lab Sample ID: LCSD 280-575145/61
 Matrix: Water
 Analysis Batch: 575145

Client Sample ID: Lab Control Sample Dup
 Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Nitrate/Nitrite-N	5.00	5.13		mg/L		103	90 - 110	0	10

Lab Sample ID: 680-215078-2 MS
 Matrix: Water
 Analysis Batch: 575145

Client Sample ID: LFM-99-02B-SPR22
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate/Nitrite-N	0.38		4.00	4.56		mg/L		105	90 - 110

Lab Sample ID: 680-215078-2 MSD
 Matrix: Water
 Analysis Batch: 575145

Client Sample ID: LFM-99-02B-SPR22
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Nitrate/Nitrite-N	0.38		4.00	4.48		mg/L		103	90 - 110	2	10

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Method: 410.4 - COD

Lab Sample ID: MB 280-575212/5
Matrix: Water
Analysis Batch: 575212

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB MB		LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Chemical Oxygen Demand	20	U	20	20	8.7	mg/L		05/17/22 11:46	1

Lab Sample ID: LCS 280-575212/3
Matrix: Water
Analysis Batch: 575212

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits

Lab Sample ID: LCSD 280-575212/4
Matrix: Water
Analysis Batch: 575212

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit

Lab Sample ID: 680-215078-2 MS
Matrix: Water
Analysis Batch: 575212

Client Sample ID: LFM-99-02B-SPR22
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits

Lab Sample ID: 680-215078-2 MSD
Matrix: Water
Analysis Batch: 575212

Client Sample ID: LFM-99-02B-SPR22
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit

Method: 9012B - Cyanide, Total and/or Amenable

Lab Sample ID: MB 680-720618/12-A
Matrix: Water
Analysis Batch: 720816

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 720618

Analyte	MB MB		LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Cyanide, Total	0.0050	U	0.010	0.0050	0.0025	mg/L		05/13/22 14:59	1

Lab Sample ID: LCS 680-720618/13-A
Matrix: Water
Analysis Batch: 720816

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 720618

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Method: 9012B - Cyanide, Total and/or Amenable (Continued)

Lab Sample ID: 680-215078-2 MS
Matrix: Water
Analysis Batch: 720816

Client Sample ID: LFM-99-02B-SPR22
Prep Type: Total/NA
Prep Batch: 720618

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec	
	Result	Qualifier	Added	Result	Qualifier				Limits	
Cyanide, Total	0.0074	J	0.0500	0.0548		mg/L		95	83 - 116	

Lab Sample ID: 680-215078-2 MSD
Matrix: Water
Analysis Batch: 720816

Client Sample ID: LFM-99-02B-SPR22
Prep Type: Total/NA
Prep Batch: 720618

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec		RPD	RPD
	Result	Qualifier	Added	Result	Qualifier				Limits		RPD	Limit
Cyanide, Total	0.0074	J	0.0500	0.0527		mg/L		91	83 - 116	4	20	

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 280-574556/1
Matrix: Water
Analysis Batch: 574556

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB	MB	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Total Dissolved Solids (TDS)	9.9	U	10	9.9	4.7	mg/L		05/11/22 10:10	1

Lab Sample ID: LCS 280-574556/2
Matrix: Water
Analysis Batch: 574556

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec	
		Result	Qualifier				Limits	
Total Dissolved Solids (TDS)	504	491		mg/L		97	88 - 114	

Lab Sample ID: LCSD 280-574556/3
Matrix: Water
Analysis Batch: 574556

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD	LCSD	Unit	D	%Rec	%Rec		RPD	RPD
		Result	Qualifier				Limits		RPD	Limit
Total Dissolved Solids (TDS)	504	494		mg/L		98	88 - 114	1	20	

QC Association Summary

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

GC Semi VOA

Prep Batch: 720300

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215078-1	LFM-03-07-SPR22	Total/NA	Water	3520C	
680-215078-2	LFM-99-02B-SPR22	Total/NA	Water	3520C	
680-215078-3	LFM-99-06A-RP-SPR22	Total/NA	Water	3520C	
MB 680-720300/8-A	Method Blank	Total/NA	Water	3520C	
LCS 680-720300/9-A	Lab Control Sample	Total/NA	Water	3520C	
680-215078-2 MS	LFM-99-02B-SPR22	Total/NA	Water	3520C	
680-215078-2 MSD	LFM-99-02B-SPR22	Total/NA	Water	3520C	

Analysis Batch: 720533

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215078-1	LFM-03-07-SPR22	Total/NA	Water	8081B 8082A	720300
680-215078-2	LFM-99-02B-SPR22	Total/NA	Water	8081B 8082A	720300
680-215078-3	LFM-99-06A-RP-SPR22	Total/NA	Water	8081B 8082A	720300
MB 680-720300/8-A	Method Blank	Total/NA	Water	8081B 8082A	720300
LCS 680-720300/9-A	Lab Control Sample	Total/NA	Water	8081B 8082A	720300
680-215078-2 MS	LFM-99-02B-SPR22	Total/NA	Water	8081B 8082A	720300
680-215078-2 MSD	LFM-99-02B-SPR22	Total/NA	Water	8081B 8082A	720300

HPLC/IC

Analysis Batch: 721624

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215078-1	LFM-03-07-SPR22	Total/NA	Water	9056A	
680-215078-2	LFM-99-02B-SPR22	Total/NA	Water	9056A	
680-215078-3	LFM-99-06A-RP-SPR22	Total/NA	Water	9056A	
MB 680-721624/2	Method Blank	Total/NA	Water	9056A	
LCS 680-721624/3	Lab Control Sample	Total/NA	Water	9056A	
LCSD 680-721624/4	Lab Control Sample Dup	Total/NA	Water	9056A	
680-215078-2 MS	LFM-99-02B-SPR22	Total/NA	Water	9056A	
680-215078-2 MSD	LFM-99-02B-SPR22	Total/NA	Water	9056A	

Metals

Prep Batch: 720064

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215078-1	LFM-03-07-SPR22	Total Recoverable	Water	3005A	
680-215078-2	LFM-99-02B-SPR22	Total Recoverable	Water	3005A	
680-215078-3	LFM-99-06A-RP-SPR22	Total Recoverable	Water	3005A	
MB 680-720064/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-720064/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-215078-2 MS	LFM-99-02B-SPR22	Total Recoverable	Water	3005A	
680-215078-2 MSD	LFM-99-02B-SPR22	Total Recoverable	Water	3005A	

Prep Batch: 720079

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215078-1	LFM-03-07-SPR22	Total/NA	Water	3010A	
680-215078-2	LFM-99-02B-SPR22	Total/NA	Water	3010A	
680-215078-3	LFM-99-06A-RP-SPR22	Total/NA	Water	3010A	
MB 680-720079/1-A	Method Blank	Total/NA	Water	3010A	
LCS 680-720079/2-A	Lab Control Sample	Total/NA	Water	3010A	
680-215078-2 MS	LFM-99-02B-SPR22	Total/NA	Water	3010A	
680-215078-2 MSD	LFM-99-02B-SPR22	Total/NA	Water	3010A	

Eurofins Savannah

QC Association Summary

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Metals

Prep Batch: 720105

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215078-1	LFM-03-07-SPR22	Total/NA	Water	7470A	
680-215078-2	LFM-99-02B-SPR22	Total/NA	Water	7470A	
680-215078-3	LFM-99-06A-RP-SPR22	Total/NA	Water	7470A	
MB 680-720105/12-A	Method Blank	Total/NA	Water	7470A	
LCS 680-720105/13-A	Lab Control Sample	Total/NA	Water	7470A	
680-215078-2 MS	LFM-99-02B-SPR22	Total/NA	Water	7470A	
680-215078-2 MSD	LFM-99-02B-SPR22	Total/NA	Water	7470A	

Analysis Batch: 720363

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215078-1	LFM-03-07-SPR22	Total/NA	Water	7470A	720105
680-215078-2	LFM-99-02B-SPR22	Total/NA	Water	7470A	720105
680-215078-3	LFM-99-06A-RP-SPR22	Total/NA	Water	7470A	720105
MB 680-720105/12-A	Method Blank	Total/NA	Water	7470A	720105
LCS 680-720105/13-A	Lab Control Sample	Total/NA	Water	7470A	720105
680-215078-2 MS	LFM-99-02B-SPR22	Total/NA	Water	7470A	720105
680-215078-2 MSD	LFM-99-02B-SPR22	Total/NA	Water	7470A	720105

Analysis Batch: 720457

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215078-1	LFM-03-07-SPR22	Total/NA	Water	6020A	720079
680-215078-2	LFM-99-02B-SPR22	Total/NA	Water	6020A	720079
680-215078-3	LFM-99-06A-RP-SPR22	Total/NA	Water	6020A	720079
MB 680-720079/1-A	Method Blank	Total/NA	Water	6020A	720079
LCS 680-720079/2-A	Lab Control Sample	Total/NA	Water	6020A	720079
680-215078-2 MS	LFM-99-02B-SPR22	Total/NA	Water	6020A	720079
680-215078-2 MSD	LFM-99-02B-SPR22	Total/NA	Water	6020A	720079

Analysis Batch: 720882

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215078-1	LFM-03-07-SPR22	Total Recoverable	Water	6010C	720064
680-215078-2	LFM-99-02B-SPR22	Total Recoverable	Water	6010C	720064
680-215078-3	LFM-99-06A-RP-SPR22	Total Recoverable	Water	6010C	720064
MB 680-720064/1-A	Method Blank	Total Recoverable	Water	6010C	720064
LCS 680-720064/2-A	Lab Control Sample	Total Recoverable	Water	6010C	720064
680-215078-2 MS	LFM-99-02B-SPR22	Total Recoverable	Water	6010C	720064
680-215078-2 MSD	LFM-99-02B-SPR22	Total Recoverable	Water	6010C	720064

General Chemistry

Analysis Batch: 574556

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215078-1	LFM-03-07-SPR22	Total/NA	Water	SM 2540C	
680-215078-2	LFM-99-02B-SPR22	Total/NA	Water	SM 2540C	
680-215078-3	LFM-99-06A-RP-SPR22	Total/NA	Water	SM 2540C	
MB 280-574556/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-574556/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 280-574556/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	
680-215078-2 MS	LFM-99-02B-SPR22	Total/NA	Water	SM 2540C	
680-215078-2 MSD	LFM-99-02B-SPR22	Total/NA	Water	SM 2540C	

QC Association Summary

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

General Chemistry

Analysis Batch: 575145

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215078-1	LFM-03-07-SPR22	Total/NA	Water	353.2	
680-215078-2	LFM-99-02B-SPR22	Total/NA	Water	353.2	
680-215078-3	LFM-99-06A-RP-SPR22	Total/NA	Water	353.2	
MB 280-575145/62	Method Blank	Total/NA	Water	353.2	
LCS 280-575145/60	Lab Control Sample	Total/NA	Water	353.2	
LCSD 280-575145/61	Lab Control Sample Dup	Total/NA	Water	353.2	
680-215078-2 MS	LFM-99-02B-SPR22	Total/NA	Water	353.2	
680-215078-2 MSD	LFM-99-02B-SPR22	Total/NA	Water	353.2	

Analysis Batch: 575212

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215078-1	LFM-03-07-SPR22	Total/NA	Water	410.4	
680-215078-2	LFM-99-02B-SPR22	Total/NA	Water	410.4	
680-215078-3	LFM-99-06A-RP-SPR22	Total/NA	Water	410.4	
MB 280-575212/5	Method Blank	Total/NA	Water	410.4	
LCS 280-575212/3	Lab Control Sample	Total/NA	Water	410.4	
LCSD 280-575212/4	Lab Control Sample Dup	Total/NA	Water	410.4	
680-215078-2 MS	LFM-99-02B-SPR22	Total/NA	Water	410.4	
680-215078-2 MSD	LFM-99-02B-SPR22	Total/NA	Water	410.4	

Analysis Batch: 720385

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215078-1	LFM-03-07-SPR22	Total/NA	Water	2320B-2011	
680-215078-2	LFM-99-02B-SPR22	Total/NA	Water	2320B-2011	
MB 680-720385/34	Method Blank	Total/NA	Water	2320B-2011	
LCS 680-720385/36	Lab Control Sample	Total/NA	Water	2320B-2011	
LCSD 680-720385/61	Lab Control Sample Dup	Total/NA	Water	2320B-2011	

Prep Batch: 720618

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215078-1	LFM-03-07-SPR22	Total/NA	Water	9012B	
680-215078-2	LFM-99-02B-SPR22	Total/NA	Water	9012B	
680-215078-3	LFM-99-06A-RP-SPR22	Total/NA	Water	9012B	
MB 680-720618/12-A	Method Blank	Total/NA	Water	9012B	
LCS 680-720618/13-A	Lab Control Sample	Total/NA	Water	9012B	
680-215078-2 MS	LFM-99-02B-SPR22	Total/NA	Water	9012B	
680-215078-2 MSD	LFM-99-02B-SPR22	Total/NA	Water	9012B	

Analysis Batch: 720621

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215078-3	LFM-99-06A-RP-SPR22	Total/NA	Water	2320B-2011	
MB 680-720621/5	Method Blank	Total/NA	Water	2320B-2011	
LCS 680-720621/7	Lab Control Sample	Total/NA	Water	2320B-2011	
LCSD 680-720621/32	Lab Control Sample Dup	Total/NA	Water	2320B-2011	

Analysis Batch: 720816

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-215078-1	LFM-03-07-SPR22	Total/NA	Water	9012B	720618
680-215078-2	LFM-99-02B-SPR22	Total/NA	Water	9012B	720618
680-215078-3	LFM-99-06A-RP-SPR22	Total/NA	Water	9012B	720618
MB 680-720618/12-A	Method Blank	Total/NA	Water	9012B	720618

Eurofins Savannah

QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

General Chemistry (Continued)

Analysis Batch: 720816 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 680-720618/13-A	Lab Control Sample	Total/NA	Water	9012B	720618
680-215078-2 MS	LFM-99-02B-SPR22	Total/NA	Water	9012B	720618
680-215078-2 MSD	LFM-99-02B-SPR22	Total/NA	Water	9012B	720618

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Lab Chronicle

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Client Sample ID: LFM-03-07-SPR22

Lab Sample ID: 680-215078-1

Date Collected: 05/04/22 09:30

Matrix: Water

Date Received: 05/06/22 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1037.6 mL	5 mL	720300	05/11/22 18:35	IR	TAL SAV
Total/NA	Analysis	8081B 8082A		1			720533	05/12/22 18:35	JCK	TAL SAV
Instrument ID: CSGAA										
Total/NA	Analysis	9056A		5	5 mL	5 mL	721624	05/19/22 16:27	AF	TAL SAV
Instrument ID: CICK										
Total Recoverable	Prep	3005A			50 mL	50 mL	720064	05/10/22 10:22	JE	TAL SAV
Total Recoverable	Analysis	6010C		1			720882	05/14/22 22:28	BCB	TAL SAV
Instrument ID: ICPH										
Total/NA	Prep	3010A			50 mL	250 mL	720079	05/10/22 11:07	JE	TAL SAV
Total/NA	Analysis	6020A		1			720457	05/11/22 14:16	BWR	TAL SAV
Instrument ID: ICPMSD										
Total/NA	Prep	7470A			50 mL	50 mL	720105	05/10/22 13:23	JKL	TAL SAV
Total/NA	Analysis	7470A		1			720363	05/11/22 11:16	JKL	TAL SAV
Instrument ID: QuickTrace2										
Total/NA	Analysis	2320B-2011		1			720385	05/11/22 22:03	DR	TAL SAV
Instrument ID: MANTECH 2										
Total/NA	Analysis	353.2		1	100 mL	100 mL	575145	05/16/22 18:24	SVC	TAL DEN
Instrument ID: WC_Alph 2										
Total/NA	Analysis	410.4		1	2 mL	2 mL	575212	05/17/22 11:46	SJD	TAL DEN
Instrument ID: WC_Genesys20										
Total/NA	Prep	9012B			6 mL	6 mL	720618	05/13/22 08:59	NVF	TAL SAV
Total/NA	Analysis	9012B		1			720816	05/13/22 14:59	NVF	TAL SAV
Instrument ID: KONELAB4										
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	574556	05/11/22 10:11	CAI	TAL DEN
Instrument ID: NoEquip										

Client Sample ID: LFM-99-02B-SPR22

Lab Sample ID: 680-215078-2

Date Collected: 05/04/22 10:50

Matrix: Water

Date Received: 05/06/22 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1020.1 mL	5 mL	720300	05/11/22 18:35	IR	TAL SAV
Total/NA	Analysis	8081B 8082A		1			720533	05/12/22 18:49	JCK	TAL SAV
Instrument ID: CSGAA										
Total/NA	Analysis	9056A		5	5 mL	5 mL	721624	05/19/22 14:33	AF	TAL SAV
Instrument ID: CICK										
Total Recoverable	Prep	3005A			50 mL	50 mL	720064	05/10/22 10:22	JE	TAL SAV
Total Recoverable	Analysis	6010C		1			720882	05/14/22 22:18	BCB	TAL SAV
Instrument ID: ICPH										
Total/NA	Prep	3010A			50 mL	250 mL	720079	05/10/22 11:07	JE	TAL SAV
Total/NA	Analysis	6020A		1			720457	05/11/22 14:03	BWR	TAL SAV
Instrument ID: ICPMSD										
Total/NA	Prep	7470A			50 mL	50 mL	720105	05/10/22 13:23	JKL	TAL SAV
Total/NA	Analysis	7470A		1			720363	05/11/22 11:19	JKL	TAL SAV
Instrument ID: QuickTrace2										

Eurofins Savannah

Lab Chronicle

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Client Sample ID: LFM-99-02B-SPR22

Lab Sample ID: 680-215078-2

Date Collected: 05/04/22 10:50

Matrix: Water

Date Received: 05/06/22 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2320B-2011		1			720385	05/11/22 22:10	DR	TAL SAV
Total/NA	Analysis	353.2		1	100 mL	100 mL	575145	05/16/22 18:28	SVC	TAL DEN
		Instrument ID: WC_Alp 2								
Total/NA	Analysis	410.4		1	2 mL	2 mL	575212	05/17/22 11:46	SJD	TAL DEN
		Instrument ID: WC_Genesys20								
Total/NA	Prep	9012B			6 mL	6 mL	720618	05/13/22 08:59	NVF	TAL SAV
Total/NA	Analysis	9012B		1			720816	05/13/22 14:59	NVF	TAL SAV
		Instrument ID: KONELAB4								
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	574556	05/11/22 10:11	CAI	TAL DEN
		Instrument ID: NoEquip								

Client Sample ID: LFM-99-06A-RP-SPR22

Lab Sample ID: 680-215078-3

Date Collected: 05/04/22 12:05

Matrix: Water

Date Received: 05/06/22 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1007.3 mL	5 mL	720300	05/11/22 18:35	IR	TAL SAV
Total/NA	Analysis	8081B 8082A		1			720533	05/12/22 19:04	JCK	TAL SAV
		Instrument ID: CSGAA								
Total/NA	Analysis	9056A		5	5 mL	5 mL	721624	05/19/22 16:39	AF	TAL SAV
		Instrument ID: CICK								
Total Recoverable	Prep	3005A			50 mL	50 mL	720064	05/10/22 10:22	JE	TAL SAV
Total Recoverable	Analysis	6010C		1			720882	05/14/22 22:43	BCB	TAL SAV
		Instrument ID: ICPH								
Total/NA	Prep	3010A			50 mL	250 mL	720079	05/10/22 11:07	JE	TAL SAV
Total/NA	Analysis	6020A		1			720457	05/11/22 14:19	BWR	TAL SAV
		Instrument ID: ICPMSD								
Total/NA	Prep	7470A			50 mL	50 mL	720105	05/10/22 13:23	JKL	TAL SAV
Total/NA	Analysis	7470A		1			720363	05/11/22 11:26	JKL	TAL SAV
		Instrument ID: QuickTrace2								
Total/NA	Analysis	2320B-2011		1			720621	05/12/22 18:47	DR	TAL SAV
		Instrument ID: MANTECH 2								
Total/NA	Analysis	353.2		1	100 mL	100 mL	575145	05/16/22 18:26	SVC	TAL DEN
		Instrument ID: WC_Alp 2								
Total/NA	Analysis	410.4		1	2 mL	2 mL	575212	05/17/22 11:46	SJD	TAL DEN
		Instrument ID: WC_Genesys20								
Total/NA	Prep	9012B			6 mL	6 mL	720618	05/13/22 08:59	NVF	TAL SAV
Total/NA	Analysis	9012B		1			720816	05/13/22 14:59	NVF	TAL SAV
		Instrument ID: KONELAB4								
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	574556	05/11/22 10:11	CAI	TAL DEN
		Instrument ID: NoEquip								

Lab Chronicle

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Laboratory References:

- = Katahdin Analytical Services Inc, 600 Technology Way, Scarborough, ME 04074
- TAL DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100
- TAL SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858



Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	09-18-22

Laboratory: Eurofins Denver

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	2907.01	10-31-23

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Method Summary

Client: Seres Engineering & Services LLC
 Project/Site: Fort Devens DCL Spring 2022

Job ID: 680-215078-1

Method	Method Description	Protocol	Laboratory
8081B 8082A	Organochlorine Pesticides & PCBs (GC)	SW846	TAL SAV
9056A	Anions, Ion Chromatography	SW846	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV
6020A	Metals (ICP/MS)	SW846	TAL SAV
7470A	Mercury (CVAA)	SW846	TAL SAV
2320B-2011	Alkalinity, Total	SM	TAL SAV
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	TAL DEN
410.4	COD	MCAWW	TAL DEN
9012B	Cyanide, Total and/or Amenable	EPA	TAL SAV
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL DEN
MA-EPH	MADEP EPH (Extractable Petroleum Hydroca	MA DEP	
MA-VPH	MADEP VPH Volatile Petroleum Hydrocarbon	MA DEP	
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL SAV
3010A	Preparation, Total Metals	SW846	TAL SAV
3520C	Liquid-Liquid Extraction (Continuous)	SW846	TAL SAV
7470A	Preparation, Mercury	SW846	TAL SAV
9012B	Cyanide, Total and/or Amenable, Distillation	SW846	TAL SAV

Protocol References:

- EPA = US Environmental Protection Agency
- MA DEP = Massachusetts Department Of Environmental Protection
- MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
- SM = "Standard Methods For The Examination Of Water And Wastewater"
- SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

- = Katahdin Analytical Services Inc, 600 Technology Way, Scarborough, ME 04074
- TAL DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100
- TAL SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858



MassDEP Analytical Protocol Certification Form

Laboratory Name: Katahdin Analytical Services, LLC.

Project #:

Project Location: Fort Devens

RTN:

This Form provides certifications for the following data set: list Laboratory Sample ID Number(s):
SP2156-1, 2, 3

Matrices: Groundwater/Surface Water • Soil/Sediment • Drinking Water • Air • Other: _____

CAM Protocol (check all that apply below):

8260 VOC CAM II A •	7470/7471 Hg CAM III B •	MassDEP VPH CAM IV A <input checked="" type="checkbox"/>	8081 Pesticides CAM V B •	7196 Hex Cr CAM VI B •	MassDEP APH CAM IX A •
8270 SVOC CAM II B •	7010 Metals CAM III C •	MassDEP EPH CAM IV B <input checked="" type="checkbox"/>	8151 Herbicides CAM V C •	8330 Explosives CAM VIII A •	TO-15 VOC CAM IX B •
6010 Metals CAM III A •	6020 Metals CAM III D •	8082 PCB CAM V A •	9014 Total Cyanide/PAC CAM VI A •	6860 Perchlorate CAM VIII B •	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	X Yes • No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	X Yes • No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	X Yes • No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	X Yes • No
E	VPH, EPH, APH, and TO-15 only: a. VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	X Yes • No X Yes • No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	X Yes X No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	X Yes • No ¹
----------	---	-------------------------

Data User Note: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.

H	Were all QC performance standards specified in the CAM protocol(s) achieved?	X Yes • No ¹
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	X Yes • No ¹

¹All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: _____

Position: Q.A. Officer

Printed Name: Leslie Dimond

Date: 06/06/2022



TEST AMERICA SAVANNAH

FORT DEVENS - LTM

SP2156

**Ms. Leslie Dimond
207-874-2400**

**KATAHDIN ANALYTICAL SERVICES
600 TECHNOLOGY WAY
SCARBOROUGH, ME 04074**

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Total number of pages: 293

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SAMPLE DATA PACKAGE

**NARRATIVE
KATAHDIN ANALYTICAL SERVICES
TEST AMERICA SAVANNAH
FORT DEVENS – LTM
SP2156**

Sample Receipt

The following samples were received on May 07, 2022 and were logged in under Katahdin Analytical Services work order number SP2156 for a hardcopy due date of May 21, 2022.

<u>Sample No.</u>	<u>Sample Identification</u>
KATAHDIN SP2156-1	TEST AMERICA SAVANNAH LFM-03-07-SPR22
SP2156-2	LFM-99-02B-SPR22
SP2156-3	LFM-99-06A-RP-SPR22

The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

We certify that the test results provided in this report meet all the requirements of the NELAP standards unless otherwise noted in this narrative or in the Report of Analysis.

We certify that the test results provided in this report are accredited under the laboratory's ISO/IEC 17025:2017 and DoD-ELAP accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation L2223.

Analytes which are reported but not listed on our ANAB scope of accreditation will be “^” flagged and the following language will be included in the case narrative for all DoD compliant work: “^” Indicates this analyte is not included on Katahdin Analytical Services DoD-ELAP Scope of Accreditation.

Sample analyses have been performed by the methods as noted herein.

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact your Katahdin Analytical Services Project Manager, **Ms. Heather Manz**. This narrative is an integral part of the Report of Analysis.

Organics Analysis

The samples of Work Order SP2156 was analyzed in accordance with Method for the Determination of Volatile Petroleum Hydrocarbons (VPH), MADEP, May 2004, Revision 1.1, and/or Method for the Determination of Extractable Petroleum Hydrocarbons (EPH), MADEP, May 2004, Revision 1.1, and/or for the specific methods listed below or on the Report of Analysis.

Sample SP2156-2 was used for the Matrix Spike (MS) and Matrix Spike Duplicate (MSD) per the clients request.

MA VPH Analysis

The MS WG317886-6 had a low recovery for the surrogate 2,5-dibromotoluene on the PID and for methyl tert-butylether. The MSD WG317886-7 had low recoveries for the surrogate 2,5-dibromotoluene on the both the PID and FID. The MSD also had low recoveries for the C5-C8 aliphatic range, the C9-C12 aliphatic range and the analytes benzene and methyl tert-butylether. These recoveries were outside of the method acceptance limits. Since the associated LCS/LCSD were acceptable, no further action was taken.

MA EPH Analysis

Due to a laboratory error, the LCSD WG318022-3 was not spiked with the extraction surrogates o-terphenyl and 5-alpha androstane. Because the recoveries of the fractionation surrogates and the spiked analytes were acceptable, and the LCS was acceptable, no further action was taken.

The MS WG318022-4 had a low recovery for the extraction surrogate 5-alpha androstane which was outside of the method acceptance limits. Since the spike recoveries were acceptable, no further action was taken.

The closing CV (file CPE10180) had high responses for five target analytes which resulted in %D's that were outside of the method acceptance limit of $\pm 25\%$. The method allows four target analytes to have %D's that are greater than $\pm 25\%$ but less than $\pm 40\%$ for a closing CV. Since a high response would indicate a high bias, and no target analytes were detected in any of the associated samples, no further action was taken.

There were no other protocol deviations or observations noted by the organics laboratory staff.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized the Quality Assurance Officer, or their designee, as verified by the following signature.

Leslie Dimond
Quality Assurance Officer

Katahdin Analytical Services, Inc.

Manual Integration Codes For GC/MS, GC, HPLC and/or IC

M1	Peak splitting.
M2	Well defined peaks on the shoulders of the other peaks.
M3	There is additional area due to a coeluting interferant.
M4	There are negative spikes in the baseline.
M5	There are rising or falling baselines.
M6	The software has failed to detect a peak or misidentified a peak.
M7	Excessive peak tailing.
M8	Analysis such as GRO, DRO and TPH require a baseline hold.
M9	Peak was not completely integrated as in GC/MS.
M10	Primary ion was correctly integrated, but secondary or tertiary ion needed manual integration as in GC/MS.
M11	For GC analysis, when a sample is diluted by 1:10 or more, the surrogate is set to undetected and then the area under the surrogate is manually integrated.
M12	Manual integration saved in method due to TurboChrom floating point error.

Katahdin Analytical Services, LLC.

Sample Receipt Condition Report

Client: <u>Eurofins TA-Sau.</u>	KAS PM: <u>HHM</u>	Sampled By: <u>Client</u>
Project:	KIMS Entry By: <u>JCB</u>	Delivered By: <u>Fedex</u>
KAS Work Order#: <u>SP2156</u>	KIMS Review By: <u>HHM</u>	Received By: <u>JCB</u>
	Labeled By: <u>EP</u>	
SDG #:	Cooler: <u>1</u> of <u>1</u>	Date/Time Rec.: <u>5/7/22 1000</u>

Receipt Criteria	Y	N	EX*	NA	Comments and/or Resolution
1. Custody seals present / intact?	/				
2. Chain of Custody present in cooler?	/				
3. Chain of Custody signed by client?	/				
4. Chain of Custody matches samples?	/				
5. Temperature Blanks present? If not, take temperature of any sample w/ IR gun.		/			Temp (°C): <u>1.9</u> Thermometer ID: IR-1
Samples received at <6 °C w/o freezing?	/				Note: Not required for metals (except Hg soil) analysis.
Ice packs or ice present?	/				The lack of ice or ice packs (i.e. no attempt to begin cooling process) or insufficient ice may not meet certain regulatory requirements and may invalidate certain data.
If yes, was there sufficient ice to meet temperature requirements?	/				
If temp. out, has the cooling process begun (i.e. ice or packs present) and sample collection times <6hrs., but samples are not yet cool?				/	
6. Volatiles: Aqueous: No bubble larger than a pea? Soil/Sediment: Received in airtight container? Received in methanol? Methanol covering soil? D.I. Water - Received within 48 hour HT?				/	
7. Trip Blank present in cooler?	/				
8. Proper sample containers and volume?	/				
9. Samples within hold time upon receipt?	/				
10. Aqueous samples properly preserved? Metals, COD, NH3, TKN, O/G, phenol, TPO4, N+N, TOC, DRO, TPH – pH <2 Sulfide - >9 Cyanide – pH >12				/	
11. Bottleneck Prepped on:					
* Log-In Notes to Exceptions: document any problems with samples or discrepancies or pH adjustments.					

Heather Manz

From: Lanier, Jerry <Jerry.Lanier@et.eurofinsus.com>
Sent: Monday, May 9, 2022 3:50 PM
To: Heather Manz; Daughtry, Beth
Cc: Leslie Dimond
Subject: RE: COC received 05/07

Follow Up Flag: Follow up
Flag Status: Flagged

Hey Heather,

Yes, I updated our login today. The -2 sample and MS/MSD should be LFM-99-02B-SPR22. Do you know what kind of TAT you can support for these?

Jerry Lanier

Phone: 912-250-0281

E-mail: Jerry.Lanier@ET.EurofinsUS.com

From: Heather Manz <hmanz@katahdinlab.com>
Sent: Monday, May 9, 2022 3:20 PM
To: Lanier, Jerry <Jerry.Lanier@et.eurofinsus.com>; Daughtry, Beth <Beth.Daughtry@et.eurofinsus.com>
Cc: Leslie Dimond <ldimond@katahdinlab.com>
Subject: COC received 05/07

EXTERNAL EMAIL*

Good Afternoon,

I noticed both samples 680-215078-1 & -2 have the same field ID of LFM-03-07-SPR22 listed on the attached COC. Is there a typo in one of those field IDs?

Thank You,
Heather Manz

Project Manager
Katahdin Analytical Services
A Small Business Enterprise
DoD ELAP Accredited
600 Technology Way
Scarborough, Maine 04074
Office - 207.874.2400 x117
Desk – 207-303-0917

www.katahdinlab.com



Chain of Custody Record



SP2156

Client Information (Sub Contract Lab)		Sampler:	Lab PM:	Carrier Tracking No(s):	COC No:							
Client Contact		Phone:	Lanier, Jerry A	State of Origin:	680-693229.1							
Shipping/Receiving		E-Mail:	Jerry.Lanier@et.eurofins.com	Massachusetts	Page: 1 of 1							
Company:		Accreditations Required (See note):										
Katahdin Analytical Services		Dept. of Defense ELAP - A2LA; DoD - ANAB										
Address:		Preservation Codes:										
600 Technology Way,		A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 F - MeOH G - Amchlor S - H2SO4 H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:										
City:		Analysis Requested:										
Scarborough												
State, Zip:												
ME, 04074												
Phone:												
Email:												
Project Name:												
Fort Devens DCL Spring 2022												
Site:												
SSOW#:												
Due Date Requested:												
5/18/2022												
TAT Requested (days):												
PO #:												
WO #:												
Project #:												
68023801												
SSOW#:												
Sample Identification - Client ID (Lab ID)		Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=wastewater, BT=BIOSUB, A=Air)	Preservation Code:	Field Filtered Sample (Yes or No)	Perform M/MSD (Yes or No)	SUB (MA VPH + BTEX)/ MA VPH	SUB (MA EPH + PAHs)/ MA EPH	Total Number of Containers	Special Instructions/Note:
LFM-03-07-SPR22 (680-215078-1)	5/4/22	09:30 Eastern	Water				X	X			5	
LFM-03-07-SPR22 (680-215078-2)	5/4/22	10:50 Eastern	Water				X	X			5	
LFM-03-07-SPR22 (680-215078-2MS)	5/4/22	10:50 Eastern	Water	MS			X	X			5	
LFM-03-07-SPR22 (680-215078-2MSD)	5/4/22	10:50 Eastern	Water	MSD			X	X			5	
LFM-99-06A-RP-SPR22 (680-215078-3)	5/4/22	12:05 Eastern	Water				X	X			5	
<p>Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing Southeast, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Southeast, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Southeast, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Southeast, LLC.</p>												
<p>Possible Hazard Identification</p> <p>Unconfirmed</p> <p>Deliverable Requested: I, II, III, IV, Other (specify) _____</p> <p>Primary Deliverable Rank: 2</p> <p>Empty Kit Relinquished by: _____ Date: _____</p> <p>Relinquished by: _____ Date/Time: 5/6 17:00 Company: KAS</p> <p>Relinquished by: _____ Date/Time: _____ Company: _____</p> <p>Relinquished by: _____ Date/Time: _____ Company: _____</p> <p>Custody Seals Intact: _____ Custody Seal No.: _____</p> <p>Δ Yes Δ No</p>												
<p>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)</p> <p>Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months</p> <p>Special Instructions/QC Requirements: _____</p> <p>Method of Shipment: _____</p> <p>Received by: _____ Date/Time: 5/7/22 10:00 Company: KAS</p> <p>Received by: _____ Date/Time: _____ Company: _____</p> <p>Received by: _____ Date/Time: _____ Company: _____</p> <p>Cooler Temperature(s) °C and Other Remarks: _____</p>												





Katahdin Analytical Services
Login Chain of Custody (In01)
May. 09, 2022
05:33 PM

Login Number: SP2156

Account: TASAV001
Test America Savannah
Project: TASAV-DEVENS

Primary Report Address:

Jerry Lanier
Test America Savannah
5102 LaRoche Avenue

Savannah, GA 31404

Jerry.Lanier@testamericainc.com

Primary Invoice Address:

Accounts Payable
Test America Savannah
5102 LaRoche Avenue

Savannah, GA 31404

email project manager

Report CC Addresses:

Invoice CC Addresses:

Quote/Incoming: TASAV-DEVENS

Login Information

ANALYSIS INSTRUCTIONS : FDS, DOD QSM 5.3 reporting with DOD limits. ND to LOD. "J" flag between MDL and PQL. Need LCS/LCSD. Follow MA MCP CAM. Include level 4 narrative.

CHECK NO. :

CLIENT PO# : 68023801, 680-215078.

CLIENT PROJECT MANAGE : Jerry Lanier

CONTRACT :

COOLER TEMPERATURE : 1.9

DELIVERY SERVICES : FedEx

EDD FORMAT : ECC-091317-TXT

ISM INSTRUCTIONS :

LOGIN INITIALS : JCB

PM : HHM

PROJECT NAME : Fort Devens - LTM

QC LEVEL : IV

REPORT INSTRUCTIONS : SDS needs all forms. Include Level 4 narrative and MCP forms (from Leslie). Send level 4 PDF & level 2 PDF. Level 2= SDP & SDS. Upload EDD to Ft. Devens Database. Email PDF, EDD, and invoice to Beth.Daughtry@Eurofinset.com & Jerry.Lanier@et.eurofinset.com. No HC.

SDG ID :

SDG STATUS :

VERBAL TAT :



Login Number: SP2156
Account: TASAV001

Test America Savannah

Project: TASAV-DEVENS

Quote/Incoming: TASAV-DEVENS

Laboratory Sample ID	Client Sample Number	Collect Date/Time	Receive Date	PR	Due Date	Verbal Due Date	Mailed
SP2156-1	LFM-03-07-SPR22	04-MAY-22 09:30	07-MAY-22		21-MAY-22		
Sample Comments: 680-215078-1.							
<i>Matrix</i>	<i>Product</i>	<i>Hold Date (shortest)</i>	<i>Notes</i>		<i>Bottle Type</i>		
Aqueous	S MA-EPH	18-MAY-22			1L N-Amber Glass		
Aqueous	S MA-VPH	18-MAY-22			40mL Vial+HCl		
SP2156-2	LFM-99-02B-SPR22	04-MAY-22 10:50	07-MAY-22		21-MAY-22		
Sample Comments: MS/MSD, 680-215078-2.							
<i>Matrix</i>	<i>Product</i>	<i>Hold Date (shortest)</i>	<i>Notes</i>		<i>Bottle Type</i>		
Aqueous	S MA-EPH	18-MAY-22			1L N-Amber Glass		
Aqueous	S MA-VPH	18-MAY-22			40mL Vial+HCl		
SP2156-3	LFM-99-06A-RP-SPR22	04-MAY-22 12:05	07-MAY-22		21-MAY-22		
Sample Comments: 680-215078-3.							
<i>Matrix</i>	<i>Product</i>	<i>Hold Date (shortest)</i>	<i>Notes</i>		<i>Bottle Type</i>		
Aqueous	S MA-EPH	18-MAY-22			1L N-Amber Glass		
Aqueous	S MA-VPH	18-MAY-22			40mL Vial+HCl		
SP2156-5	MS CHARGE LFM-03-07-SPR22	04-MAY-22 10:50	07-MAY-22		21-MAY-22		
Sample Comments: Not a sample, MS charge for SP2156-2.							
<i>Matrix</i>	<i>Product</i>	<i>Hold Date (shortest)</i>	<i>Notes</i>		<i>Bottle Type</i>		
Aqueous	S MA-EPH	18-MAY-22			1L N-Amber Glass		
Aqueous	S MA-VPH	18-MAY-22			40mL Vial+HCl		
SP2156-6	MSD CHARGE LFM-03-07-SPR22	04-MAY-22 10:50	07-MAY-22		21-MAY-22		
Sample Comments: Not a sample, MSD charge for SP2156-2.							
<i>Matrix</i>	<i>Product</i>	<i>Hold Date (shortest)</i>	<i>Notes</i>		<i>Bottle Type</i>		
Aqueous	S MA-EPH	18-MAY-22			1L N-Amber Glass		
Aqueous	S MA-VPH	18-MAY-22			40mL Vial+HCl		

Total Samples: 5

Total Analyses: 10

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SAMPLE DATA SUMMARY PACKAGE

KATAHDIN ANALYTICAL SERVICES - ORGANIC DATA QUALIFIERS

The sampled date indicated on the attached Report(s) of Analysis (ROA) is the date for which a grab sample was collected or the date for which a composite sample was completed. Beginning and start times for composite samples can be found on the Chain-of-Custody.

U Indicates the compound was analyzed for but not detected above the specified level. This level may be the Limit of Quantitation (LOQ)(previously called Practical Quantitation Level (PQL)), the Limit of Detection (LOD) or Method Detection Limit (MDL) as required by the client.

Note: All results reported as "U" MDL have a 50% rate for false negatives compared to those results reported as "U" PQL/LOQ or "U" LOD, where the rate of false negatives is <1%.

* Compound recovery or percent RPD (relative percent difference) was outside of quality control limits.

D Indicates the result was obtained from analysis of a diluted sample. Surrogate recoveries may not be calculable.

E Estimated value. This flag identifies compounds whose concentrations exceed the upper level of the calibration range of the instrument for that specific analysis.

J Estimated value. The analyte was detected in the sample at a concentration less than the laboratory Limit of Quantitation (LOQ)(previously called Practical Quantitation Limit (PQL)), but above the Method Detection Limit (MDL).

or

J Used for Pesticides, PCBs, Herbicides, Formaldehyde, Explosives and Method 504.1 analytes when there is a greater than 40% difference for detected concentrations between the two GC columns.

B Indicates the analyte was detected in the laboratory method blank analyzed concurrently with the sample.

C Indicates that the flagged compound did not meet DoD criteria in the corresponding daily calibration verification (CV).

L Indicates that the flagged compound did not meet DoD criteria in the corresponding Laboratory Control Sample (LCS) and/or Laboratory Control Sample Duplicate (LCSD) prepared and/or analyzed concurrently with the sample.

M Indicates that the flagged compound did not meet DoD criteria in the Matrix Spike and/or Matrix Spike Duplicate prepared and/or analyzed concurrently with the native sample.

N Presumptive evidence of a compound based on a mass spectral library search.

A Indicates that a tentatively identified compound is a suspected aldol-condensation product.

P Used for Pesticide/Aroclor analyte when there is a greater than 25% difference for detected concentrations between the two GC columns. (for CLP methods only).

Report of Analytical Results

SDG: SP2156
Lab ID: SP2156-1
Client ID: LFM-03-07-SPR22
Matrix: AQ
Lab File ID: CPE20175.D

Sample Date: 04-MAY-22
Extract Date: 12-MAY-22
Extracted By: AP/GN
Extraction Method: SW846 3510C
Lab Prep Batch: WG318022

Report Date: 03-JUN-22
Analysis Date: 25-MAY-22
Analyst: JLP
Analysis Method: MA DEP EPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C9-C18 Aliphatics	U	74	ug/L	1	100	98.	49.	74.
C19-C36 Aliphatics	U	74	ug/L	1	100	98.	49.	74.
C11-C22 Aromatics	U	74	ug/L	1	100	98.	49.	74.
Naphthalene	U	1.5	ug/L	1	2	2.0	0.88	1.5
2-Methylnaphthalene	U	1.5	ug/L	1	2	2.0	0.78	1.5
Phenanthrene	U	1.5	ug/L	1	2	2.0	0.88	1.5
Acenaphthylene	U	1.5	ug/L	1	2	2.0	0.78	1.5
Acenaphthene	U	1.9	ug/L	1	2	2.0	1.8	1.9
Anthracene	U	1.5	ug/L	1	2	2.0	1.4	1.5
Benzo(a)anthracene	U	1.5	ug/L	1	2	2.0	1.4	1.5
Benzo(a)pyrene	U	1.5	ug/L	1	2	2.0	1.3	1.5
Benzo(b)fluoranthene	U	1.5	ug/L	1	2	2.0	0.78	1.5
Benzo(g,h,i)perylene	U	1.5	ug/L	1	2	2.0	1.3	1.5
Benzo(k)fluoranthene	U	1.5	ug/L	1	2	2.0	0.98	1.5
Chrysene	U	1.5	ug/L	1	2	2.0	0.88	1.5
Dibenzo(a,h)anthracene	U	1.5	ug/L	1	2	2.0	1.2	1.5
Fluoranthene	U	1.5	ug/L	1	2	2.0	0.78	1.5
Fluorene	U	1.5	ug/L	1	2	2.0	0.88	1.5
Indeno(1,2,3-cd)pyrene	U	1.5	ug/L	1	2	2.0	1.4	1.5
Pyrene	U	1.5	ug/L	1	2	2.0	1.1	1.5
5-Alpha Androstane		43.4	%					
o-Terphenyl		83.2	%					
2-Fluorobiphenyl		111.	%					
2-Bromonaphthalene		95.0	%					

Report of Analytical Results

SDG: SP2156
Lab ID: SP2156-2
Client ID: LFM-99-02B-SPR22
Matrix: AQ
Lab File ID: CPE20176.D

Sample Date: 04-MAY-22
Extract Date: 12-MAY-22
Extracted By: AP/GN
Extraction Method: SW846 3510C
Lab Prep Batch: WG318022

Report Date: 03-JUN-22
Analysis Date: 25-MAY-22
Analyst: JLP
Analysis Method: MA DEP EPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C9-C18 Aliphatics	U	71	ug/L	1	100	95.	48.	71.
C19-C36 Aliphatics	U	71	ug/L	1	100	95.	48.	71.
C11-C22 Aromatics	U	71	ug/L	1	100	95.	48.	71.
Naphthalene	U	1.4	ug/L	1	2	1.9	0.86	1.4
2-Methylnaphthalene	U	1.4	ug/L	1	2	1.9	0.76	1.4
Phenanthrene	U	1.4	ug/L	1	2	1.9	0.86	1.4
Acenaphthylene	U	1.4	ug/L	1	2	1.9	0.76	1.4
Acenaphthene	U	1.8	ug/L	1	2	1.9	1.7	1.8
Anthracene	U	1.4	ug/L	1	2	1.9	1.3	1.4
Benzo(a)anthracene	U	1.4	ug/L	1	2	1.9	1.3	1.4
Benzo(a)pyrene	U	1.4	ug/L	1	2	1.9	1.2	1.4
Benzo(b)fluoranthene	U	1.4	ug/L	1	2	1.9	0.76	1.4
Benzo(g,h,i)perylene	U	1.4	ug/L	1	2	1.9	1.2	1.4
Benzo(k)fluoranthene	U	1.4	ug/L	1	2	1.9	0.95	1.4
Chrysene	U	1.4	ug/L	1	2	1.9	0.86	1.4
Dibenzo(a,h)anthracene	U	1.4	ug/L	1	2	1.9	1.1	1.4
Fluoranthene	U	1.4	ug/L	1	2	1.9	0.76	1.4
Fluorene	U	1.4	ug/L	1	2	1.9	0.86	1.4
Indeno(1,2,3-cd)pyrene	U	1.4	ug/L	1	2	1.9	1.3	1.4
Pyrene	U	1.4	ug/L	1	2	1.9	1.0	1.4
5-Alpha Androstane		48.1	%					
o-Terphenyl		74.4	%					
2-Fluorobiphenyl		96.0	%					
2-Bromonaphthalene		90.1	%					

Report of Analytical Results

SDG: SP2156
Lab ID: SP2156-3
Client ID: LFM-99-06A-RP-SPR22
Matrix: AQ
Lab File ID: CPE20177.D

Sample Date: 04-MAY-22
Extract Date: 12-MAY-22
Extracted By: AP/GN
Extraction Method: SW846 3510C
Lab Prep Batch: WG318022

Report Date: 03-JUN-22
Analysis Date: 25-MAY-22
Analyst: JLP
Analysis Method: MA DEP EPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C9-C18 Aliphatics	U	74	ug/L	1	100	99.	50.	74.
C19-C36 Aliphatics	U	74	ug/L	1	100	99.	50.	74.
C11-C22 Aromatics	U	74	ug/L	1	100	99.	50.	74.
Naphthalene	U	1.5	ug/L	1	2	2.0	0.89	1.5
2-Methylnaphthalene	U	1.5	ug/L	1	2	2.0	0.79	1.5
Phenanthrene	U	1.5	ug/L	1	2	2.0	0.89	1.5
Acenaphthylene	U	1.5	ug/L	1	2	2.0	0.79	1.5
Acenaphthene	U	1.9	ug/L	1	2	2.0	1.8	1.9
Anthracene	U	1.5	ug/L	1	2	2.0	1.4	1.5
Benzo(a)anthracene	U	1.5	ug/L	1	2	2.0	1.4	1.5
Benzo(a)pyrene	U	1.5	ug/L	1	2	2.0	1.3	1.5
Benzo(b)fluoranthene	U	1.5	ug/L	1	2	2.0	0.79	1.5
Benzo(g,h,i)perylene	U	1.5	ug/L	1	2	2.0	1.3	1.5
Benzo(k)fluoranthene	U	1.5	ug/L	1	2	2.0	0.99	1.5
Chrysene	U	1.5	ug/L	1	2	2.0	0.89	1.5
Dibenzo(a,h)anthracene	U	1.5	ug/L	1	2	2.0	1.2	1.5
Fluoranthene	U	1.5	ug/L	1	2	2.0	0.79	1.5
Fluorene	U	1.5	ug/L	1	2	2.0	0.89	1.5
Indeno(1,2,3-cd)pyrene	U	1.5	ug/L	1	2	2.0	1.4	1.5
Pyrene	U	1.5	ug/L	1	2	2.0	1.1	1.5
5-Alpha Androstane		51.7	%					
o-Terphenyl		90.1	%					
2-Fluorobiphenyl		113.	%					
2-Bromonaphthalene		112.	%					

Report of Analytical Results

SDG: SP2156
Lab ID: WG318022-1
Client ID: Method Blank
Matrix: AQ
Lab File ID: CPE20170.D

Sample Date: N/A
Extract Date: 12-MAY-22
Extracted By: AP/GN
Extraction Method: SW846 3510C
Lab Prep Batch: WG318022

Report Date: 03-JUN-22
Analysis Date: 25-MAY-22
Analyst: JLP
Analysis Method: MA DEP EPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C9-C18 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C19-C36 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C11-C22 Aromatics	U	75	ug/L	1	100	100	50.	75.
Naphthalene	U	1.5	ug/L	1	2	2.0	0.90	1.5
2-Methylnaphthalene	U	1.5	ug/L	1	2	2.0	0.80	1.5
Phenanthrene	U	1.5	ug/L	1	2	2.0	0.90	1.5
Acenaphthylene	U	1.5	ug/L	1	2	2.0	0.80	1.5
Acenaphthene	U	1.9	ug/L	1	2	2.0	1.8	1.9
Anthracene	U	1.5	ug/L	1	2	2.0	1.4	1.5
Benzo(a)anthracene	U	1.5	ug/L	1	2	2.0	1.4	1.5
Benzo(a)pyrene	U	1.5	ug/L	1	2	2.0	1.3	1.5
Benzo(b)fluoranthene	U	1.5	ug/L	1	2	2.0	0.80	1.5
Benzo(g,h,i)perylene	U	1.5	ug/L	1	2	2.0	1.3	1.5
Benzo(k)fluoranthene	U	1.5	ug/L	1	2	2.0	1.0	1.5
Chrysene	U	1.5	ug/L	1	2	2.0	0.90	1.5
Dibenzo(a,h)anthracene	U	1.5	ug/L	1	2	2.0	1.2	1.5
Fluoranthene	U	1.5	ug/L	1	2	2.0	0.80	1.5
Fluorene	U	1.5	ug/L	1	2	2.0	0.90	1.5
Indeno(1,2,3-cd)pyrene	U	1.5	ug/L	1	2	2.0	1.4	1.5
Pyrene	U	1.5	ug/L	1	2	2.0	1.1	1.5
5-Alpha Androstane		58.2	%					
o-Terphenyl		65.1	%					
2-Fluorobiphenyl		89.7	%					
2-Bromonaphthalene		74.7	%					

Form 2

System Monitoring Compound Recovery

Lab Name: Katahdin Analytical Services **SDG:** SP2156

Matrix: AQ

Client Sample ID	Lab Sample ID	Col. ID	2BN	#	2FBP	#	5AA	#	OTP	#
LFM-03-07-SPR22	SP2156-1		95.0		111.		43.4		83.2	
LFM-99-02B-SPR22	SP2156-2		90.1		96.0		48.1		74.4	
LFM-99-06A-RP-SPR22	SP2156-3		112.		113.		51.7		90.1	
Method Blank	WG318022-1		74.7		89.7		58.2		65.1	
Laboratory Control S	WG318022-2		81.3		93.4		56.6		70.4	
Laboratory Control S	WG318022-3		74.7		95.7		0.00	*	0.00	*
Matrix Spike	WG318022-4		73.0		99.8		13.4	*	50.2	
Matrix Spike Duplica	WG318022-5		101.		113.		55.8		92.5	

QC Limits

2BN	2-BROMONAPHTHALENE	40-140
2FBP	2-FLUOROBIPHENYL	40-140
5AA	5-ALPHA ANDROSTANE	40-140
OTP	O-TERPHENYL	40-140

= Column to be used to flag recovery limits.
 * = Values outside of contract required QC limits.
 D= System Monitoring Compound diluted out.

LCS/LCSD Recovery Report

LCS ID: WG318022-2
LCSD ID: WG318022-3
SDG: SP2156
LCS File ID: CPE20171.D

Extract Date: 12-MAY-22
Extracted By: AP/GN
Extraction Method: SW846 3510C
Lab Prep Batch: WG318022
LCSD File ID: CPE10172a.D

Analysis Date: 25-MAY-22
Analyst: JLP
Analysis Method: MA DEP EPH 04-1.1
Matrix: AQ
Report Date: 27-MAY-22

Compound	Spike Amt	LCS Conc	LCS Rec (%)	LCSD Conc	LCSD Rec (%)	Conc Units	RPD (%)	RPD Limit	Limits
Unadjusted C11-C22 Aromatics	1530	1050	68.6	894.	58.4	ug/L	16	25	40-140
C9-C18 Aliphatics	540.	301.	55.7	239.	44.2	ug/L	23	25	40-140
C19-C36 Aliphatics	720.	511.	71.0	408.	56.7	ug/L	22	25	40-140
Naphthalene	90.0	53.6	59.6	45.1	50.1	ug/L	17	25	40-140
2-Methylnaphthalene	90.0	53.0	58.9	43.5	48.3	ug/L	20	25	40-140
Phenanthrene	90.0	60.0	66.7	51.8	57.6	ug/L	15	25	40-140
Acenaphthylene	90.0	53.3	59.2	47.0	52.2	ug/L	12	25	40-140
Acenaphthene	90.0	55.8	62.0	48.2	53.6	ug/L	15	25	40-140
Anthracene	90.0	63.9	71.0	54.5	60.6	ug/L	16	25	40-140
Benzo(a)anthracene	90.0	66.4	73.8	55.5	61.7	ug/L	18	25	40-140
Benzo(a)pyrene	90.0	64.2	71.3	53.1	59.0	ug/L	19	25	40-140
Benzo(b)fluoranthene	90.0	65.1	72.3	52.9	58.8	ug/L	21	25	40-140
Benzo(g,h,i)perylene	90.0	60.6	67.3	50.5	56.1	ug/L	18	25	40-140
Benzo(k)fluoranthene	90.0	63.2	70.2	53.9	59.9	ug/L	16	25	40-140
Chrysene	90.0	61.0	67.8	51.8	57.6	ug/L	16	25	40-140
Dibenzo(a,h)anthracene	90.0	63.3	70.3	53.2	59.1	ug/L	17	25	40-140
Fluoranthene	90.0	60.8	67.6	51.8	57.6	ug/L	16	25	40-140
Fluorene	90.0	58.4	64.9	50.7	56.3	ug/L	14	25	40-140
Indeno(1,2,3-cd)pyrene	90.0	58.9	65.4	49.2	54.7	ug/L	18	25	40-140
Pyrene	90.0	60.2	66.9	51.3	57.0	ug/L	16	25	40-140
5-Alpha Androstane			56.6		0.00*				40-140
o-Terphenyl			70.4		0.00*				40-140
2-Fluorobiphenyl			93.4		95.7				40-140
2-Bromonaphthalene			81.3		74.7				40-140

MS/MSD Recovery Report

MS ID: WG318022-4
MSD ID: WG318022-5
Sample ID: SP2156-2
Client ID: LFM-99-02B-SPR22
SDG: SP2156
MS File ID: CPE20173.D

Extract Date: 12-MAY-22
Extracted By: AP/GN
Extraction Method: SW846 3510C
Lab Prep Batch: WG318022
Report Date: 06-JUN-22
MSD File ID: CPE20174.D

Analysis Date: 25-MAY-22
Analyst: JLP
Analysis Method: MA DEP EPH 04-1.1
Matrix: AQ
% Solids: NA

Compound	MS Spike	MSD Spike	Conc Units	Samp Conc	MS Conc	MSD Conc	MS Rec (%)	MSD Rec (%)	RPD (%)	RPD Limit	Limits
Unadjusted C11-C22 Aromatics	1460	1460	ug/L	U71	944	1290	64.8	88.5	31*	25	40-140
C9-C18 Aliphatics	514.	514.	ug/L	U71	280	305	54.4	59.3	8	25	40-140
C19-C36 Aliphatics	686.	686.	ug/L	U71	455	499	66.4	72.8	9	25	40-140
Naphthalene	85.7	85.7	ug/L	U1.4	43.2	63.8	50.4	74.4	38*	25	40-140
2-Methylnaphthalene	85.7	85.7	ug/L	U1.4	44.4	64.6	51.8	75.4	37*	25	40-140
Phenanthrene	85.7	85.7	ug/L	U1.4	55.7	74.9	65.0	87.4	29*	25	40-140
Acenaphthylene	85.7	85.7	ug/L	U1.4	46.9	65.1	54.7	76.0	32*	25	40-140
Acenaphthene	85.7	85.7	ug/L	U1.8	51	69	59.5	80.5	30*	25	40-140
Anthracene	85.7	85.7	ug/L	U1.4	59.3	80.2	69.2	93.6	30*	25	40-140
Benzo(a)anthracene	85.7	85.7	ug/L	U1.4	61.1	81.6	71.3	95.2	29*	25	40-140
Benzo(a)pyrene	85.7	85.7	ug/L	U1.4	58.7	78.1	68.5	91.1	28*	25	40-140
Benzo(b)fluoranthene	85.7	85.7	ug/L	U1.4	58	78.7	67.7	91.8	30*	25	40-140
Benzo(g,h,i)perylene	85.7	85.7	ug/L	U1.4	55.2	74.2	64.4	86.6	29*	25	40-140
Benzo(k)fluoranthene	85.7	85.7	ug/L	U1.4	59.6	77.9	69.5	90.9	27*	25	40-140
Chrysene	85.7	85.7	ug/L	U1.4	57	75.7	66.5	88.3	28*	25	40-140
Dibenzo(a,h)anthracene	85.7	85.7	ug/L	U1.4	58	77.7	67.7	90.6	29*	25	40-140
Fluoranthene	85.7	85.7	ug/L	U1.4	56.3	75.6	65.7	88.2	29*	25	40-140
Fluorene	85.7	85.7	ug/L	U1.4	53.8	72.2	62.8	84.2	29*	25	40-140
Indeno(1,2,3-cd)pyrene	85.7	85.7	ug/L	U1.4	53.1	70.7	62.0	82.5	28*	25	40-140
Pyrene	85.7	85.7	ug/L	U1.4	55.6	74.8	64.9	87.3	29*	25	40-140
5-Alpha Androstane							13.4*	55.8			40-140
o-Terphenyl							50.2	92.5			40-140
2-Fluorobiphenyl							99.8	113.			40-140
2-Bromonaphthalene							73.0	101.			40-140

Form 4 Method Blank Summary

Lab Name : Katahdin Analytical Services
Lab Sample ID : WG318022-1
Lab File ID : CPE10170.D
Instrument ID : GC12

SDG : SP2156
Date Analyzed : 25-MAY-22
Time Analyzed : 15:45
Date Extracted : 12-MAY-22

This Method Blank applies to the following samples and QC Samples:

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Laboratory Control S	WG318022-2	CPE10171.D	05/25/22	16:40
Laboratory Control S	WG318022-3	CPE10172.D	05/25/22	17:38
Matrix Spike	WG318022-4	CPE10173.D	05/25/22	18:35
Matrix Spike Duplica	WG318022-5	CPE10174.D	05/25/22	19:32
LFM-03-07-SPR22	SP2156-1	CPE10175.D	05/25/22	20:29
LFM-99-02B-SPR22	SP2156-2	CPE10176.D	05/25/22	21:26
LFM-99-06A-RP-SPR22	SP2156-3	CPE10177.D	05/25/22	22:23

Form 4 Method Blank Summary

Lab Name : Katahdin Analytical Services
Lab Sample ID : WG318022-1
Lab File ID : CPE10170A.D
Instrument ID : GC12

SDG : SP2156
Date Analyzed : 25-MAY-22
Time Analyzed : 15:45
Date Extracted : 12-MAY-22

This Method Blank applies to the following samples and QC Samples:

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Laboratory Control S	WG318022-2	CPE10171A.D	05/25/22	16:40
Laboratory Control S	WG318022-3	CPE10172A.D	05/25/22	17:38
Matrix Spike	WG318022-4	CPE10173A.D	05/25/22	18:35
Matrix Spike Duplica	WG318022-5	CPE10174A.D	05/25/22	19:32
LFM-03-07-SPR22	SP2156-1	CPE10175A.D	05/25/22	20:29
LFM-99-02B-SPR22	SP2156-2	CPE10176A.D	05/25/22	21:26
LFM-99-06A-RP-SPR22	SP2156-3	CPE10177A.D	05/25/22	22:23

Form 4 Method Blank Summary

Lab Name : Katahdin Analytical Services
Lab Sample ID : WG318022-1
Lab File ID : CPE20170.D
Instrument ID : GC12

SDG : SP2156
Date Analyzed : 25-MAY-22
Time Analyzed : 15:45
Date Extracted : 12-MAY-22

This Method Blank applies to the following samples and QC Samples:

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Laboratory Control S	WG318022-2	CPE20171.D	05/25/22	16:40
Laboratory Control S	WG318022-3	CPE20172.D	05/25/22	17:38
Matrix Spike	WG318022-4	CPE20173.D	05/25/22	18:35
Matrix Spike Duplica	WG318022-5	CPE20174.D	05/25/22	19:32
LFM-03-07-SPR22	SP2156-1	CPE20175.D	05/25/22	20:29
LFM-99-02B-SPR22	SP2156-2	CPE20176.D	05/25/22	21:26
LFM-99-06A-RP-SPR22	SP2156-3	CPE20177.D	05/25/22	22:23



Form 6 Initial Calibration Summary

Lab Name : Katahdin Analytical Services

SDG: SP2156

Instrument ID: GC12

Calibration Date(s): 06-MAY-22 10:36

Lab File IDs : CPE10027.D CPE10026.D CPE10023a.

06-MAY-22 14:59

CPE10025.D CPE10024.D

	Level 1	Level 2	Level 3	Level 4	Level 5	Curve Type	Curve			%RSD or R ²		
	1.0000	10.0000	50.0000	100.0000	200.0000		b	m1	m2	Result	Limit	
Unadjusted C11-C22 Aromatic	3057292	3037811	2682449	2409765	2762901	AVG		2790044		9.64628	25	O
Naphthalene	3351163	3487577	3173249	2870744	3153856	AVG		3207318		7.25428	25	O
2-Methylnaphthalene	3299544	3441998	3098331	2798176	3082906	AVG		3144191		7.76466	25	O
Acenaphthylene	3425687	3386890	3025049	2729263	3014760	AVG		3116330		9.31928	25	O
Acenaphthene	3461308	3499569	3120408	2817390	3110184	AVG		3201772		8.81737	25	O
Fluorene	3228516	3327827	2955495	2674764	2962561	AVG		3029833		8.48560	25	O
Phenanthrene	3100763	3254634	2877798	2616521	2882794	AVG		2946502		8.25077	25	O
Anthracene	3202629	2855962	2539748	2295643	2542158	AVG		2687228		13.0278	25	O
Fluoranthene	3168110	3224500	2814323	2568060	2791643	AVG		2913327		9.48702	25	O
Pyrene	3209362	3259917	2847531	2586384	2803656	AVG		2941370		9.72178	25	O
Benzo(a)Anthracene	2724698	2795849	2431594	2201352	2328668	AVG		2496432		10.2356	25	O
Chrysene	3010970	3006751	2623169	2379944	2502125	AVG		2704592		10.7509	25	O
Benzo(b)Fluoranthene	2958908	2982054	2556169	2251703	2388495	AVG		2627466		12.6081	25	O
Benzo(k)Fluoranthene	2786612	2722427	2382561	2161451	2368268	AVG		2484264		10.5764	25	O
Benzo(a)Pyrene	2598222	2483624	2175882	1930994	2168229	AVG		2271390		11.8030	25	O
Indeno(1,2,3-cd)Pyrene	2773549	2733667	2387674	2070388	3010456	AVG		2595147		14.18317	25	O
Dibenzo(a,h)Anthracene	2769509	2559143	2251147	1978736	2788864	AVG		2469480		14.15221	25	O
Benzo(g,h,i)Perylene	2904412	2620408	2341507	2034501	3069690	AVG		2594103		16.1276	25	O
2-Fluorobiphenyl	2997483	3116164	2812880	2540161	2808029	AVG		2854943		7.66626	25	
2-Bromonaphthalene	1976473	2091462	1887341	1709409	1898247	AVG		1912586		7.31068	25	
O-Terphenyl	3332188	3469411	2979408	2743080	2993980	AVG		3103613		9.44183	25	

Legend: O = Acceptable
W = Failed %RSD Value
X = Failed R² Value
Y = Failed Minimum RF

Form 6 Initial Calibration Summary

Lab Name : Katahdin Analytical Services

SDG: SP2156

Instrument ID: GC12

Calibration Date(s): 21-FEB-22 12:40

Lab File IDs : CPB20053.DCPB20052.DCPB20051.D

21-FEB-22 16:22

CPB20050.DCPB20049.D

	Level 1	Level 2	Level 3	Level 4	Level 5	Curve Type	b	m1	m2	%RSD or R ²			
	1.0000	20.0000	50.0000	100.0000	200.0000					Result	Limit		
C9-C18 Aliphatic	1022845	1323057	985617	1217924	1204653	AVG		1150819		12.34517	25	O	
C19-C36 Aliphatic	937088	1283090	964097	1210095	1205987	AVG		1120072		14.10735	25	O	
C-9	1049185	1322844	988857	1209195	1193204	AVG		1152657		11.58616	30	O	
C-10	1078003	1327302	986556	1215709	1198075	AVG		1161129		11.33942	25	O	
C-12	1030750	1349918	1005652	1240816	1224225	AVG		1170272		12.58222	25	O	
C-14	1002013	1327576	989201	1224412	1210250	AVG		1150690		12.92322	25	O	
C-16	1000059	1323648	985882	1223727	1213843	AVG		1149432		12.98310	25	O	
C-18	977058	1287056	957555	1193688	1188324	AVG		1120736		12.99347	25	O	
C-19	1002959	1304879	970903	1212823	1208397	AVG		1139992		12.75267	25	O	
C-20	984039	1300389	969307	1213468	1209880	AVG		1135416		13.16398	25	O	
C-22	946813	1295585	967271	1213466	1210730	AVG		1126773		14.09466	25	O	
C-24	960843	1296116	968035	1213175	1206878	AVG		1129009		13.66906	25	O	
C-26	975210	1293463	968335	1214251	1208367	AVG		1131925		13.25448	25	O	
C-28	1010885	1304250	981181	1230520	1223790	AVG		1150125		12.56785	25	O	
C-30	933937	1269015	958590	1202426	1196904	AVG		1112174		13.87709	25	O	
C-36	682018	1201024	929155	1180634	1182949	AVG		1035156		21.94743	25	O	
5-alpha androstane	1133073	1228298	1094842	1138147	1136002	AVG		1146072		4.30097	25		

Legend: O = Acceptable
W = Failed %RSD Value
X = Failed R² Value
Y = Failed Minimum RF

Form 7 Calibration Verification Summary

Lab Name: Katahdin Analytical Services **SDG:** SP2156
Lab ID: WG318723-2 **Analytical Date:** 05/25/22 08:12
Lab File ID: CPE10164.D **Instrument ID:** GC12
Initial Calibration Date(s): 05/06/22 10:36 05/06/22 14:59 **Column ID:** A

Compound	RRF/Amount	RF50	Min RRF	%D/ %Drift	Max %D/ %Drift	Curve Type
Naphthalene	3207318	3057586	0.010	-4.66843	25.00000	Averaged
2-Methylnaphthalene	3144191	3014731	0.010	-4.11744	25.00000	Averaged
Acenaphthylene	3116330	2931755	0.010	-5.92281	25.00000	Averaged
Acenaphthene	3201772	3067918	0.010	-4.18061	25.00000	Averaged
Fluorene	3029833	2938051	0.010	-3.02926	25.00000	Averaged
Phenanthrene	2946502	2906102	0.010	-1.37110	25.00000	Averaged
Anthracene	2687228	2302478	0.010	-14.31773	25.00000	Averaged
Fluoranthene	2913327	2943195	0.010	1.02521	25.00000	Averaged
Pyrene	2941370	2929869	0.010	-0.39101	25.00000	Averaged
Benzo(a)Anthracene	2496432	2543796	0.010	1.89726	25.00000	Averaged
Chrysene	2704592	2776003	0.010	2.64038	25.00000	Averaged
Benzo(b)Fluoranthene	2627466	2703862	0.010	2.90760	25.00000	Averaged
Benzo(k)Fluoranthene	2484264	2658093	0.010	6.99721	25.00000	Averaged
Benzo(a)Pyrene	2271390	2296523	0.010	1.10651	25.00000	Averaged
Indeno(1,2,3-cd)Pyrene	2595147	2646001	0.010	1.95958	25.00000	Averaged
Dibenzo(a,h)Anthracene	2469480	2507842	0.010	1.55345	25.00000	Averaged
Benzo(g,h,i)Perylene	2594103	2549897	0.010	-1.70413	25.00000	Averaged
2-Fluorobiphenyl	2854943	2763360	0.010	-3.20787	25.00000	Averaged
2-Bromonaphthalene	1912586	1872224	0.010	-2.11036	25.00000	Averaged
O-Terphenyl	3103613	3073446	0.010	-0.97201	25.00000	Averaged

* = Compound out of QC criteria

Form 7 Calibration Verification Summary

Lab Name: Katahdin Analytical Services **SDG:** SP2156
Lab ID: WG318723-3 **Analytical Date:** 05/26/22 01:14
Lab File ID: CPE10180.D **Instrument ID:** GC12
Initial Calibration Date(s): 05/06/22 10:36 05/06/22 14:59 **Column ID:** A

Compound	RRF/Amount	RF50	Min RRF	%D/ %Drift	Max %D/ %Drift	Curve Type
Naphthalene	3207318	3902144	0.010	21.66378	25.00000	Averaged
2-Methylnaphthalene	3144191	3835973	0.010	22.00191	25.00000	Averaged
Acenaphthylene	3116330	3722118	0.010	19.43916	25.00000	Averaged
Acenaphthene	3201772	3883419	0.010	21.28970	25.00000	Averaged
Fluorene	3029833	3704934	0.010	22.28180	25.00000	Averaged
Phenanthrene	2946502	3642995	0.010	23.63798	25.00000	Averaged
Anthracene	2687228	2844531	0.010	5.85371	25.00000	Averaged
Fluoranthene	2913327	3657858	0.010	25.55604	25.00000	Averaged <-
Pyrene	2941370	3637115	0.010	23.65378	25.00000	Averaged
Benzo(a)Anthracene	2496432	3131805	0.010	25.45125	25.00000	Averaged <-
Chrysene	2704592	3420789	0.010	26.48078	25.00000	Averaged <-
Benzo(b)Fluoranthene	2627466	3381263	0.010	28.68913	25.00000	Averaged <-
Benzo(k)Fluoranthene	2484264	3217962	0.010	29.53383	25.00000	Averaged <-
Benzo(a)Pyrene	2271390	2823223	0.010	24.29493	25.00000	Averaged
Indeno(1,2,3-cd)Pyrene	2595147	3293637	0.010	26.91526	25.00000	Averaged <-
Dibenzo(a,h)Anthracene	2469480	3098148	0.010	25.45753	25.00000	Averaged <-
Benzo(g,h,i)Perylene	2594103	3156760	0.010	21.68983	25.00000	Averaged
2-Fluorobiphenyl	2854943	3500308	0.010	22.60518	25.00000	Averaged
2-Bromonaphthalene	1912586	2363152	0.010	23.55791	25.00000	Averaged
O-Terphenyl	3103613	3840235	0.010	23.73431	25.00000	Averaged

* = Compound out of QC criteria

Form 7 Calibration Verification Summary

Lab Name: Katahdin Analytical Services **SDG:** SP2156
Lab ID: WG318723-2 **Analytical Date:** 05/25/22 08:12
Lab File ID: CPE20164.D **Instrument ID:** GC12
Initial Calibration Date(s): 02/21/22 12:40 02/21/22 16:22 **Column ID:** B

Compound	RRF/Amount	RF50	Min RRF	%D/ %Drift	Max %D/ %Drift	Curve Type
C9-C18 Aliphatic	1150819	1104586	0.010	-4.01748	25.00000	Averaged
C19-C36 Aliphatic	1120072	1128111	0.010	0.71775	25.00000	Averaged
C-9	1152657	1081927	0.010	-6.13622	30.00000	Averaged
C-10	1161129	1095550	0.010	-5.64787	25.00000	Averaged
C-12	1170272	1095060	0.010	-6.42691	25.00000	Averaged
C-14	1150690	1105729	0.010	-3.90735	25.00000	Averaged
C-16	1149432	1125396	0.010	-2.09106	25.00000	Averaged
C-18	1120736	1123851	0.010	0.27790	25.00000	Averaged
C-19	1139992	1133268	0.010	-0.58988	25.00000	Averaged
C-20	1135416	1131981	0.010	-0.30256	25.00000	Averaged
C-22	1126773	1160895	0.010	3.02828	25.00000	Averaged
C-24	1129009	1060971	0.010	-6.02638	25.00000	Averaged
C-26	1131925	1176638	0.010	3.95016	25.00000	Averaged
C-28	1150125	1146302	0.010	-0.33238	25.00000	Averaged
C-30	1112174	1131099	0.010	1.70159	25.00000	Averaged
C-36	1035156	1083733	0.010	4.69269	25.00000	Averaged
5-alpha androstane	1146072	1229988	0.010	7.32203	25.00000	Averaged

* = Compound out of QC criteria

Form 7 Calibration Verification Summary

Lab Name: Katahdin Analytical Services **SDG:** SP2156
Lab ID: WG318723-3 **Analytical Date:** 05/26/22 01:14
Lab File ID: CPE20180.D **Instrument ID:** GC12
Initial Calibration Date(s): 02/21/22 12:40 02/21/22 16:22 **Column ID:** B

Compound	RRF/Amount	RF50	Min RRF	%D/ %Drift	Max %D/ %Drift	Curve Type
C9-C18 Aliphatic	1150819	1097341	0.010	-4.64701	25.00000	Averaged
C19-C36 Aliphatic	1120072	1119124	0.010	-0.08456	25.00000	Averaged
C-9	1152657	1076077	0.010	-6.64379	30.00000	Averaged
C-10	1161129	1083868	0.010	-6.65394	25.00000	Averaged
C-12	1170272	1085302	0.010	-7.26070	25.00000	Averaged
C-14	1150690	1099280	0.010	-4.46779	25.00000	Averaged
C-16	1149432	1119922	0.010	-2.56730	25.00000	Averaged
C-18	1120736	1119595	0.010	-0.10181	25.00000	Averaged
C-19	1139992	1129454	0.010	-0.92440	25.00000	Averaged
C-20	1135416	1127839	0.010	-0.66739	25.00000	Averaged
C-22	1126773	1155011	0.010	2.50613	25.00000	Averaged
C-24	1129009	1053256	0.010	-6.70970	25.00000	Averaged
C-26	1131925	1165729	0.010	2.98639	25.00000	Averaged
C-28	1150125	1133833	0.010	-1.41652	25.00000	Averaged
C-30	1112174	1118138	0.010	0.53621	25.00000	Averaged
C-36	1035156	1069735	0.010	3.34046	25.00000	Averaged
5-alpha androstane	1146072	1217645	0.010	6.24503	25.00000	Averaged

* = Compound out of QC criteria

Form 8 Analytical Sequence

Lab Name: Katahdin Analytical Services
Instrument ID: GC12

SDG: SP2156
Sample Fraction: ALIPHATIC

Client Sample ID	Lab Sample ID	Date Analyzed	Time Analyzed	5AA	
Initial Calibration	WG314185-11	02/21/22	12:40	19.12	
Initial Calibration	WG314185-10	02/21/22	13:36	19.11	
Initial Calibration	WG314185-9	02/21/22	14:31	19.11	
Initial Calibration	WG314185-8	02/21/22	15:26	19.11	
Initial Calibration	WG314185-7	02/21/22	16:22	19.11	
Independent Source	WG314185-12	02/21/22	17:19		
Continuing Calibrati	WG318723-2	05/25/22	08:12	19.11	
Method Blank	WG318022-1	05/25/22	15:45	19.11	
Laboratory Control S	WG318022-2	05/25/22	16:40	19.11	
Laboratory Control S	WG318022-3	05/25/22	17:38		
Matrix Spike	WG318022-4	05/25/22	18:35	19.11	
Matrix Spike Duplica	WG318022-5	05/25/22	19:32	19.11	
LFM-03-07-SPR22	SP2156-1	05/25/22	20:29	19.11	
LFM-99-02B-SPR22	SP2156-2	05/25/22	21:26	19.11	
LFM-99-06A-RP-SPR22	SP2156-3	05/25/22	22:23	19.11	
Continuing Calibrati	WG318723-3	05/26/22	01:14	19.11	



Form 8 Analytical Sequence

Lab Name: Katahdin Analytical Services
Instrument ID: GC12

SDG: SP2156
Sample Fraction: AROMATIC

Client Sample ID	Lab Sample ID	Date Analyzed	Time Analyzed	2FBP	2BN	OTP
Initial Calibration	WG317595-3	05/06/22	10:36	14.25	15.80	20.34
Initial Calibration	WG317595-5	05/06/22	12:13	14.25	15.80	20.35
Initial Calibration	WG317595-4	05/06/22	13:08	14.25	15.80	20.34
Initial Calibration	WG317595-2	05/06/22	14:04	14.25	15.80	20.34
Initial Calibration	WG317595-1	05/06/22	14:59	14.25	15.80	20.34
Independent Source	WG317595-6	05/06/22	15:54			
Continuing Calibrati	WG318723-2	05/25/22	08:12	14.24	15.79	20.33
Method Blank	WG318022-1	05/25/22	15:45	14.25	15.80	20.34
Laboratory Control S	WG318022-2	05/25/22	16:40	14.24	15.79	20.33
Laboratory Control S	WG318022-3	05/25/22	17:38	14.25	15.80	
Matrix Spike	WG318022-4	05/25/22	18:35	14.25	15.8	20.34
Matrix Spike Duplica	WG318022-5	05/25/22	19:32	14.25	15.8	20.34
LFM-03-07-SPR22	SP2156-1	05/25/22	20:29	14.25	15.80	20.34
LFM-99-02B-SPR22	SP2156-2	05/25/22	21:26	14.25	15.8	20.34
LFM-99-06A-RP-SPR22	SP2156-3	05/25/22	22:23	14.25	15.80	20.34
Continuing Calibrati	WG318723-3	05/26/22	01:14	14.25	15.80	20.34

Report of Analytical Results

SDG: SP2156
Lab ID: SP2156-1
Client ID: LFM-03-07-SPR22
Matrix: AQ
Lab File ID: 2PE10033.D

Sample Date: 04-MAY-22
Extract Date: 10-MAY-22
Extracted By: DL/GM
Extraction Method: MA-VPH
Lab Prep Batch: WG317886

Report Date: 01-JUN-22
Analysis Date: 10-MAY-22
Analyst: DL/GM
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		92.1	%					
2,5-Dibromotoluene (PID)		86.1	%					

Report of Analytical Results

SDG: SP2156
Lab ID: SP2156-2
Client ID: LFM-99-02B-SPR22
Matrix: AQ
Lab File ID: 2PE10034.D

Sample Date: 04-MAY-22
Extract Date: 10-MAY-22
Extracted By: DL/GM
Extraction Method: MA-VPH
Lab Prep Batch: WG317886

Report Date: 01-JUN-22
Analysis Date: 10-MAY-22
Analyst: DL/GM
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		98.4	%					
2,5-Dibromotoluene (PID)		90.7	%					

Report of Analytical Results

SDG: SP2156
Lab ID: SP2156-3RA
Client ID: LFM-99-06A-RP-SPR22
Matrix: AQ
Lab File ID: 2PE10051.D

Sample Date: 04-MAY-22
Extract Date: 17-MAY-22
Extracted By: DL/GM
Extraction Method: MA DEP VPH 04-1.1
Lab Prep Batch:

Report Date: 01-JUN-22
Analysis Date: 17-MAY-22
Analyst: DL/GM
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		98.8	%					
2,5-Dibromotoluene (PID)		86.7	%					

Report of Analytical Results

SDG: SP2156
Lab ID: WG317886-1
Client ID: Method Blank
Matrix: AQ
Lab File ID: 2PE10030.D

Sample Date: N/A
Extract Date: 10-MAY-22
Extracted By: DL/GM
Extraction Method: MA DEP VPH 04-1.1
Lab Prep Batch: WG317886

Report Date: 01-JUN-22
Analysis Date: 10-MAY-22
Analyst: DL/GM
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		94.1	%					
2,5-Dibromotoluene (PID)		97.2	%					

Report of Analytical Results

SDG: SP2156
Lab ID: WG318300-1
Client ID: Method Blank
Matrix: AQ
Lab File ID: 2PE10048.D

Sample Date: N/A
Extract Date: 17-MAY-22
Extracted By: DL/GM
Extraction Method: MA DEP VPH 04-1.1
Lab Prep Batch: WG318300

Report Date: 01-JUN-22
Analysis Date: 17-MAY-22
Analyst: DL/GM
Analysis Method: MA DEP VPH 04-1.1
% Solids: N/A

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
C5-C8 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C12 Aliphatics	U	75	ug/L	1	100	100	50.	75.
C9-C10 Aromatics	U	75	ug/L	1	100	100	50.	75.
Benzene	U	2.0	ug/L	1	3	3.0	0.31	2.0
Ethylbenzene	U	3.8	ug/L	1	5	5.0	0.42	3.8
Methyl tert-butylether	U	3.8	ug/L	1	5	5.0	0.31	3.8
Naphthalene	U	3.8	ug/L	1	5	5.0	1.6	3.8
Toluene	U	3.8	ug/L	1	5	5.0	0.34	3.8
m+p-Xylenes	U	7.5	ug/L	1	10	10.	0.92	7.5
o-Xylene	U	3.8	ug/L	1	5	5.0	0.47	3.8
2,5-Dibromotoluene (FID)		99.9	%					
2,5-Dibromotoluene (PID)		88.0	%					

Form 2
System Monitoring Compound Recovery

Lab Name: Katahdin Analytical Services

SDG: SP2156

Matrix: AQ

Client Sample ID	Lab Sample ID	Col. ID	DBT-FID #	DBT-PID #
LFM-03-07-SPR22	SP2156-1	B	92.1	86.1
LFM-99-02B-SPR22	SP2156-2	B	98.4	90.7
LFM-99-06A-RP-SPR22	SP2156-3RA	B	98.8	86.7
Method Blank	WG317886-1	B	94.1	97.2
Laboratory Control S	WG317886-2	B	99.2	94.5
Laboratory Control S	WG317886-3	B	106.	108.
Matrix Spike	WG317886-6	B	72.1	68.1 *
Matrix Spike Duplica	WG317886-7	B	67.0 *	63.5 *
Method Blank	WG318300-1	B	99.9	88.0
Laboratory Control S	WG318300-2	B	106.	94.9
Laboratory Control S	WG318300-3	B	106.	95.2

QC Limits

DBT-FID 2,5-DIBROMOTOLUENE (FID)

70-130

DBT-PID 2,5-DIBROMOTOLUENE (PID)

70-130

= Column to be used to flag recovery limits.
* = Values outside of contract required QC limits.
D= System Monitoring Compound diluted out.

LCS/LCSD Recovery Report

LCS ID: WG317886-2
LCSD ID: WG317886-3
SDG: SP2156
LCS File ID: 2PE10031.D

Extract Date: 10-MAY-22
Extracted By: DL/GM
Extraction Method: MA-VPH
Lab Prep Batch: WG317886
LCSD File ID: 2PE10032.D

Analysis Date: 10-MAY-22
Analyst: DL/GM
Analysis Method: MA DEP VPH 04-1.1
Matrix: AQ
Report Date: 23-MAY-22

Compound	Spike Amt	LCS Conc	LCS Rec (%)	LCSD Conc	LCSD Rec (%)	Conc Units	RPD (%)	RPD Limit	Limits
C5-C8 Aliphatics	300.	271.	90.3	281.	93.7	ug/L	4	25	70-130
C9-C12 Aliphatics	200.	209.	104.	215.	108.	ug/L	3	25	70-130
C9-C10 Aromatics	100.	102.	102.	105.	105.	ug/L	3	25	70-130
Benzene	100.	94.9	94.9	95.6	95.6	ug/L	1	25	70-130
Ethylbenzene	100.	101.	101.	100.	100.	ug/L	1	25	70-130
Methyl tert-butylether	100.	92.4	92.4	95.8	95.8	ug/L	4	25	70-130
Naphthalene	100.	105.	105.	112.	112.	ug/L	6	25	70-130
Toluene	100.	97.9	97.9	97.3	97.3	ug/L	1	25	70-130
m+p-Xylenes	200.	197.	98.5	197.	98.5	ug/L	0	25	70-130
o-Xylene	100.	100.	100.	102.	102.	ug/L	2	25	70-130
2,5-Dibromotoluene (FID)			99.2		106.				70-130
2,5-Dibromotoluene (PID)			94.5		108.				70-130

LCS/LCSD Recovery Report

LCS ID: WG318300-2
LCSD ID: WG318300-3
SDG: SP2156
LCS File ID: 2PE10049.D

Extract Date: 17-MAY-22
Extracted By: DL/GM
Extraction Method: MA-VPH
Lab Prep Batch: WG318300
LCSD File ID: 2PE10050.D

Analysis Date: 17-MAY-22
Analyst: DL/GM
Analysis Method: MA DEP VPH 04-1.1
Matrix: AQ
Report Date: 23-MAY-22

Compound	Spike Amt	LCS Conc	LCS Rec (%)	LCSD Conc	LCSD Rec (%)	Conc Units	RPD (%)	RPD Limit	Limits
C5-C8 Aliphatics	300.	269.	89.7	258.	86.0	ug/L	4	25	70-130
C9-C12 Aliphatics	200.	204.	102.	205.	102.	ug/L	0	25	70-130
C9-C10 Aromatics	100.	96.6	96.6	97.4	97.4	ug/L	1	25	70-130
Benzene	100.	88.2	88.2	89.6	89.6	ug/L	2	25	70-130
Ethylbenzene	100.	93.2	93.2	94.6	94.6	ug/L	1	25	70-130
Methyl tert-butylether	100.	86.4	86.4	87.2	87.2	ug/L	1	25	70-130
Naphthalene	100.	98.7	98.7	99.7	99.7	ug/L	1	25	70-130
Toluene	100.	90.4	90.4	91.8	91.8	ug/L	2	25	70-130
m+p-Xylenes	200.	183.	91.5	185.	92.5	ug/L	1	25	70-130
o-Xylene	100.	93.8	93.8	94.7	94.7	ug/L	1	25	70-130
2,5-Dibromotoluene (FID)			106.		106.				70-130
2,5-Dibromotoluene (PID)			94.9		95.2				70-130

MS/MSD Recovery Report

MS ID: WG317886-6
MSD ID: WG317886-7
Sample ID: SP2156-2
Client ID: LFM-99-02B-SPR22
SDG: SP2156
MS File ID: 2PE10035.D

Extract Date: 10-MAY-22
Extracted By: DL/GM
Extraction Method: MA-VPH
Lab Prep Batch: WG317886
Report Date: 02-JUN-22
MSD File ID: 2PE10036.D

Analysis Date: 10-MAY-22
Analyst: DL/GM
Analysis Method: MA DEP VPH 04-1.1
Matrix: AQ
% Solids: NA

Compound	MS Spike	MSD Spike	Conc Units	Samp Conc	MS Conc	MSD Conc	MS Rec (%)	MSD Rec (%)	RPD (%)	RPD Limit	Limits
C5-C8 Aliphatics	300.	300.	ug/L	U75	218.	200.	72.7	66.7*	9	50	70-130
C9-C12 Aliphatics	200.	200.	ug/L	U75	150.	133.	75.0	66.5*	12	50	70-130
C9-C10 Aromatics	100	100	ug/L	U75	76.6	71.4	76.6	71.4	7	50	70-130
Benzene	100	100	ug/L	U2.0	72.5	68.3	72.5	68.3*	6	50	70-130
Ethylbenzene	100	100	ug/L	U3.8	76.3	71.5	76.3	71.5	6	50	70-130
Methyl tert-butylether	100	100	ug/L	U3.8	67.5	63.5	67.5*	63.5*	6	50	70-130
Naphthalene	100	100	ug/L	U3.8	76.3	72.4	76.3	72.4	5	50	70-130
Toluene	100	100	ug/L	U3.8	74.6	70	74.6	70.0	6	50	70-130
m+p-Xylenes	200	200	ug/L	U7.5	150	141	75.0	70.5	6	50	70-130
o-Xylene	100	100	ug/L	U3.8	75.7	70.8	75.7	70.8	7	50	70-130
2,5-Dibromotoluene (FID)							72.1	67.0*			70-130
2,5-Dibromotoluene (PID)							68.1*	63.5*			70-130

Form 4 Method Blank Summary

Lab Name : Katahdin Analytical Services
Lab Sample ID : WG317886-1
Lab File ID : 2PE10030.D
Instrument ID : GC02

SDG : SP2156
Date Analyzed : 10-MAY-22
Time Analyzed : 09:53
Date Extracted : 10-MAY-22

This Method Blank applies to the following samples and QC Samples:

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Laboratory Control S	WG317886-2	2PE10031.D	05/10/22	10:34
Laboratory Control S	WG317886-3	2PE10032.D	05/10/22	11:16
LFM-03-07-SPR22	SP2156-1	2PE10033.D	05/10/22	17:21
LFM-99-02B-SPR22	SP2156-2	2PE10034.D	05/10/22	18:03
Matrix Spike	WG317886-6	2PE10035.D	05/10/22	18:46
Matrix Spike Duplica	WG317886-7	2PE10036.D	05/10/22	19:29

Form 4 Method Blank Summary

Lab Name : Katahdin Analytical Services
Lab Sample ID : WG318300-1
Lab File ID : 2PE10048.D
Instrument ID : GC02

SDG : SP2156
Date Analyzed : 17-MAY-22
Time Analyzed : 10:01
Date Extracted : 17-MAY-22

This Method Blank applies to the following samples and QC Samples:

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Laboratory Control S	WG318300-2	2PE10049.D	05/17/22	10:41
Laboratory Control S	WG318300-3	2PE10050.D	05/17/22	11:22
LFM-99-06A-RP-SPR22	SP2156-3RA	2PE10051.D	05/17/22	13:20

Form 7 Calibration Verification Summary

Lab Name: Katahdin Analytical Services **SDG:** SP2156
Lab ID: WG317886-4 **Analytical Date:** 05/10/22 08:44
Lab File ID: 2PE10029.D **Instrument ID:** GC02
Initial Calibration Date(s): 05/03/22 16:12 05/03/22 19:45 **Column ID:** B

Compound	RRF/Amount	RF50	Min RRF	%D/ %Drift	Max %D/ %Drift	Curve Type
C5-C8 Aliphatic	5755	5624	0.100	-2.27502	25.00000	Averaged
C9-C12 Aliphatic	5948	5889	0.100	-1.00623	25.00000	Averaged
n-Pentane	5178	4938	0.100	-4.63652	25.00000	Averaged
2-Methylpentane	5754	5623	0.100	-2.27942	25.00000	Averaged
Methyl tert-butylether	4276	4281	0.100	0.11022	25.00000	Averaged
2,2,4-Trimethylpentane	6334	6312	0.100	-0.34040	25.00000	Averaged
Benzene	7441	7368	0.100	-0.98289	25.00000	Averaged
Toluene	7222	7290	0.100	0.93269	25.00000	Averaged
n-Nonane	5746	5852	0.100	1.84241	30.00000	Averaged
n-Decane	5530	5556	0.100	0.46808	25.00000	Averaged
Ethylbenzene	6848	7069	0.100	3.21536	25.00000	Averaged
m+p-Xylene	7159	7279	0.100	1.68310	25.00000	Averaged
o-Xylene	7269	7452	0.100	2.51818	25.00000	Averaged
1,2,4-trimethylbenzene	6869	7292	0.100	6.15547	25.00000	Averaged
n-Butylcyclohexane	6367	6221	0.100	-2.28685	25.00000	Averaged
Naphthalene	5006	5143	0.100	2.73248	25.00000	Averaged
2,5-Dibromotoluene (FID)	2124	2236	0.100	5.28178	25.00000	Averaged

* = Compound out of QC criteria

Form 7 Calibration Verification Summary

Lab Name: Katahdin Analytical Services **SDG:** SP2156
Lab ID: WG317886-5 **Analytical Date:** 05/11/22 01:55
Lab File ID: 2PE10045.D **Instrument ID:** GC02
Initial Calibration Date(s): 05/03/22 16:12 05/03/22 19:45 **Column ID:** B

Compound	RRF/Amount	RF50	Min RRF	%D/ %Drift	Max %D/ %Drift	Curve Type
C5-C8 Aliphatic	5755	4948	0.100	-14.03267	25.00000	Averaged
C9-C12 Aliphatic	5948	5146	0.100	-13.49023	25.00000	Averaged
n-Pentane	5178	4238	0.100	-18.16243	25.00000	Averaged
2-Methylpentane	5754	4959	0.100	-13.82527	25.00000	Averaged
Methyl tert-butylether	4276	4379	0.100	2.40424	25.00000	Averaged
2,2,4-Trimethylpentane	6334	5647	0.100	-10.84485	25.00000	Averaged
Benzene	7441	7548	0.100	1.44155	25.00000	Averaged
Toluene	7222	7510	0.100	3.98623	25.00000	Averaged
n-Nonane	5746	5127	0.100	-10.76459	30.00000	Averaged
n-Decane	5530	4823	0.100	-12.79045	25.00000	Averaged
Ethylbenzene	6848	7242	0.100	5.74732	25.00000	Averaged
m+p-Xylene	7159	7428	0.100	3.76493	25.00000	Averaged
o-Xylene	7269	7570	0.100	4.13906	25.00000	Averaged
1,2,4-trimethylbenzene	6869	7279	0.100	5.96215	25.00000	Averaged
n-Butylcyclohexane	6367	5469	0.100	-14.09807	25.00000	Averaged
Naphthalene	5006	5661	0.100	13.08279	25.00000	Averaged
2,5-Dibromotoluene (FID)	2124	2205	0.100	3.83448	25.00000	Averaged

* = Compound out of QC criteria

Form 7 Calibration Verification Summary

Lab Name: Katahdin Analytical Services **SDG:** SP2156
Lab ID: WG318300-4 **Analytical Date:** 05/17/22 08:55
Lab File ID: 2PE10047.D **Instrument ID:** GC02
Initial Calibration Date(s): 05/03/22 16:12 05/03/22 19:45 **Column ID:** B

Compound	RRF/Amount	RF50	Min RRF	%D/ %Drift	Max %D/ %Drift	Curve Type
C5-C8 Aliphatic	5755	6092	0.100	5.84130	25.00000	Averaged
C9-C12 Aliphatic	5948	5763	0.100	-3.11890	25.00000	Averaged
n-Pentane	5178	5697	0.100	10.02032	25.00000	Averaged
2-Methylpentane	5754	6116	0.100	6.28266	25.00000	Averaged
Methyl tert-butylether	4276	4274	0.100	-0.04505	25.00000	Averaged
2,2,4-Trimethylpentane	6334	6462	0.100	2.02378	25.00000	Averaged
Benzene	7441	7431	0.100	-0.13057	25.00000	Averaged
Toluene	7222	7354	0.100	1.81549	25.00000	Averaged
n-Nonane	5746	5811	0.100	1.12330	30.00000	Averaged
n-Decane	5530	5423	0.100	-1.94414	25.00000	Averaged
Ethylbenzene	6848	7141	0.100	4.27604	25.00000	Averaged
m+p-Xylene	7159	7319	0.100	2.23726	25.00000	Averaged
o-Xylene	7269	7427	0.100	2.17700	25.00000	Averaged
1,2,4-trimethylbenzene	6869	7263	0.100	5.73331	25.00000	Averaged
n-Butylcyclohexane	6367	6103	0.100	-4.13931	25.00000	Averaged
Naphthalene	5006	5371	0.100	7.29835	25.00000	Averaged
2,5-Dibromotoluene (FID)	2124	2193	0.100	3.25914	25.00000	Averaged

* = Compound out of QC criteria

Form 7 Calibration Verification Summary

Lab Name: Katahdin Analytical Services **SDG:** SP2156
Lab ID: WG318300-5 **Analytical Date:** 05/17/22 16:44
Lab File ID: 2PE10056.D **Instrument ID:** GC02
Initial Calibration Date(s): 05/03/22 16:12 05/03/22 19:45 **Column ID:** B

Compound	RRF/Amount	RF50	Min RRF	%D/ %Drift	Max %D/ %Drift	Curve Type
C5-C8 Aliphatic	5755	5650	0.100	-1.82443	25.00000	Averaged
C9-C12 Aliphatic	5948	5229	0.100	-12.09070	25.00000	Averaged
n-Pentane	5178	5293	0.100	2.21779	25.00000	Averaged
2-Methylpentane	5754	5691	0.100	-1.10989	25.00000	Averaged
Methyl tert-butylether	4276	4220	0.100	-1.31063	25.00000	Averaged
2,2,4-Trimethylpentane	6334	5968	0.100	-5.77830	25.00000	Averaged
Benzene	7441	7518	0.100	1.04106	25.00000	Averaged
Toluene	7222	7460	0.100	3.28369	25.00000	Averaged
n-Nonane	5746	5220	0.100	-9.15095	30.00000	Averaged
n-Decane	5530	4817	0.100	-12.90329	25.00000	Averaged
Ethylbenzene	6848	7176	0.100	4.78302	25.00000	Averaged
m+p-Xylene	7159	7400	0.100	3.37700	25.00000	Averaged
o-Xylene	7269	7477	0.100	2.86046	25.00000	Averaged
1,2,4-trimethylbenzene	6869	7225	0.100	5.16908	25.00000	Averaged
n-Butylcyclohexane	6367	5642	0.100	-11.38487	25.00000	Averaged
Naphthalene	5006	5001	0.100	-0.10661	25.00000	Averaged
2,5-Dibromotoluene (FID)	2124	2011	0.100	-5.29564	25.00000	Averaged

* = Compound out of QC criteria

Form 8 GC Analytical Sequence

Lab Name : Katahdin Analytical Services
Instrument ID : GC02

SDG : SP2156

Client Sample ID	Lab Sample ID	Date Analyzed	Time Analyzed	DBT (FID)	DBT (PID)
Initial Calibration	WG317688-4	05/03/22	16:12	31.071	
Initial Calibration	WG317688-4	05/03/22	16:12		31.081
Initial Calibration	WG317688-1	05/03/22	16:54	31.078	
Initial Calibration	WG317688-1	05/03/22	16:54		31.087
Initial Calibration	WG317688-2	05/03/22	17:36	31.077	
Initial Calibration	WG317688-2	05/03/22	17:36		31.085
Initial Calibration	WG317688-3	05/03/22	18:19	31.077	
Initial Calibration	WG317688-3	05/03/22	18:19		31.084
Initial Calibration	WG317688-5	05/03/22	19:02	31.075	
Initial Calibration	WG317688-5	05/03/22	19:02		31.088
Initial Calibration	WG317688-6	05/03/22	19:45	31.079	
Initial Calibration	WG317688-6	05/03/22	19:45		31.08
Independent Source	WG317688-7	05/04/22	10:58	31.071	31.082
Continuing Calibrati	WG317886-4	05/10/22	08:44	31.059	31.069
Method Blank	WG317886-1	05/10/22	09:53	31.06	31.071
Laboratory Control S	WG317886-2	05/10/22	10:34	31.058	31.069
Laboratory Control S	WG317886-3	05/10/22	11:16	31.06	31.071
LFM-03-07-SPR22	SP2156-1	05/10/22	17:21	31.074	31.085
LFM-99-02B-SPR22	SP2156-2	05/10/22	18:03	31.073	31.083
Matrix Spike	WG317886-6	05/10/22	18:46	31.069	31.079
Matrix Spike Duplica	WG317886-7	05/10/22	19:29	31.068	31.078
Continuing Calibrati	WG317886-5	05/11/22	01:55	31.069	31.08
Continuing Calibrati	WG318300-4	05/17/22	08:55	31.093	31.103
Method Blank	WG318300-1	05/17/22	10:01	31.093	31.103
Laboratory Control S	WG318300-2	05/17/22	10:41	31.093	31.103
Laboratory Control S	WG318300-3	05/17/22	11:22	31.094	31.104
LFM-99-06A-RP-SPR22	SP2156-3RA	05/17/22	13:20	31.095	31.105
Continuing Calibrati	WG318300-5	05/17/22	16:44	31.096	31.107

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Heather Levesque
669 Marina Drive, Suite B7, Charleston, SC 29492
(619) 370-0374, halevesque@seres-es.com

Boston COC # DCL_SPR22
#215

Project Name: Former Fort Devens, Long Term Monitoring

Project Number: 30130800

WBS Code:

Laboratory: Eurofins Environment 4 estables Ave, Savannah, GA

POC: Jerry Lanier, (912) 250-0281, jerry.lanier@eteurofins.com

Ship to: Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404

Event: Seres-Arcadis JV, Long Term Monitoring, DCL, Spring 2022

Comments:
A2320B (A) = Alkalinity
E353.2 (A) = Nitrite Nitrate as N
MADEPEP (A) = EPH with PAHs
MADEPVP (A) = VPH with targets
SW6010C (D) = Ba Cd Cr Cu Fe Pb Mn Se Ag
SW7470A (A) = Mercury
SW8081B (A) = Pesticides
SW9012B (A) = Cyanide
SW9056A (A) = Cl SO4

Equipment:

Code Matrix

WG Ground Water

Code	Container/Preservative
2	2x 1 Liter amber glass, 1 L HCl to pH <2; Cool < 6degC
4	3x 40mL glass VOA Vials, HCl, pH <2; Cool < 6degC
5	1x 125mL plastic, Cool < 6degC
6	1x 125mL plastic, Cool < 6degC
9	1x 250mL plastic, HNO3, pH <2; Cool < 6degC
21	1x 2-1 Liter amber glass, Cool < 6degC
46	1x 250mL plastic, Cool < 6degC
47	1x 500mL amber glass, H2SO4, Cool < 6degC
48	1x 250mL plastic, NaOH to pH >12; Cool < 6degC
49	1x 500mL plastic, Cool < 6degC



680-215078 Chain of Custody

ID	Sample ID	Matrix	Date	Time	Samp Init.	Analytical Test Method	A2320B (A)	A2540C - TDS	E353.2 (A)	E410.4 - COD	MADEPEP (A)	MADEPVP (A)	SW6020A - As	SW7470A (A)	SW8081B (A)	SW9012B (A)	SW9056A (A)	Location ID	Sample Type	Depth (ft bgs)		Cooler	Comments	
																				Top	Bottom			
1	LFM-03-07-SPR22	WG	5-4-22	930	DC	X	X	X	X	X	X	X	X	X	X	X	X	LFM-03-07	N1	10.90	20.90	1		
2	LFM-99-02B-SPR22	WG	5-4-22	915	GS	X	X	X	X	X	X	X	X	X	X	X	X	LFM-99-02B	MS1	14.50	25.83	1		
3	LFM-99-02B-SPR22	WG	5-4-22	1050	GS	X	X	X	X	X	X	X	X	X	X	X	X	LFM-99-02B	N1	14.50	25.83	1		
4	LFM-99-02B-SPR22	WG	5-4-22	1200	GS	X	X	X	X	X	X	X	X	X	X	X	X	LFM-99-02B	SD1	14.50	25.83	1		
5	LFM-99-05A-SPR22	WG				X	X	X	X	X	X	X	X	X	X	X	X	LFM-99-05A	N1	19.00	29.98	1		
6	DCL-DUP01-SPR22	WG				X	X	X	X	X	X	X	X	X	X	X	X	LFM-99-05A	FD1	19.00	29.98	1		
7	LFM-99-06A-RP-SPR22	WG	5-4-22	1205	DC	X	X	X	X	X	X	X	X	X	X	X	X	LFM-99-06A-RP	N1	17.50	32.50	1		
8																								
9																								
10																								

Turnaround Time: Standard

Handwritten notes:
3.9-3.3
3.4-2-8
5.2-4.6
2.9-2.3
5/6

Relinquished by: *Heather Levesque*
Date: 5/4/22
Time: 4:45
COC # 51522 1122

Received by: *Qyh*
Date: 5/4/22
Time: 1645



Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-215078-1

Login Number: 215078

List Number: 1

Creator: Watters, David

List Source: Eurofins Savannah

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-215078-1

Login Number: 215078

List Number: 2

Creator: Lee, Jerry

List Source: Eurofins Denver

List Creation: 05/07/22 03:55 PM

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



ANALYTICAL REPORT

PREPARED FOR

Attn: Heather Levesque
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Generated 1/13/2023 2:27:30 PM Revision 1

JOB DESCRIPTION

Seres-Arcadis JV, LTM, DCL, Fall 2022

JOB NUMBER

680-224346-1

Eurofins Savannah

Job Notes

The test results in this report meet NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted. Results pertain only to samples listed in this report. This report may not be reproduced, except in full, without the written approval of the laboratory. Questions should be directed to the person who signed this report.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization



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Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Qualifiers

GC VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

GC Semi VOA

Qualifier	Qualifier Description
B	Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

HPLC/IC

Qualifier	Qualifier Description
D	The reported value is from a dilution.
U	Undetected at the Limit of Detection.

Metals

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

General Chemistry

Qualifier	Qualifier Description
B	Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)

Eurofins Savannah

Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

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Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-224346-1	DCL-DUP01-FAL22	Water	10/27/22 11:15	10/29/22 09:45
680-224346-2	LFM-99-02B-FAL22	Water	10/27/22 10:25	10/29/22 09:45
680-224346-3	LFM-99-05A-FAL22	Water	10/27/22 11:15	10/29/22 09:45
680-224346-4	LFM-99-06A-RP-FAL22	Water	10/27/22 10:10	10/29/22 09:45

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Case Narrative

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Job ID: 680-224346-1

Laboratory: Eurofins Savannah

Narrative

**Job Narrative
680-224346-1**

Receipt

The samples were received on 10/29/2022 9:45 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 4 coolers at receipt time were 3.3°C, 4.8°C, 4.9°C and 5.4°C

Receipt Exceptions

The following samples were listed on the Chain of Custody (COC); however, no samples were received: DCL-DUP01-FAL22 (680-224346-1), LFM-99-02B-FAL22 (680-224346-2), LFM-99-02B-FAL22 (680-224346-2[MS]), LFM-99-02B-FAL22 (680-224346-2[MSD]), LFM-99-05A-FAL22 (680-224346-3) and LFM-99-06A-RP-FAL22 (680-224346-4).

Only one sample received 40ml amber vial for phenolics.

GC VOA

Method MAVPH2.1: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 620-17232 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC Semi VOA

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Pesticides/PCBs

Method 8081B_8082A_D5: The continuing calibration verification (CCV) associated with batch 680-749075 recovered above the upper control limit for Endrin and Heptachlor. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data has been reported. The associated samples are impacted: DCL-DUP01-FAL22 (680-224346-1), LFM-99-02B-FAL22 (680-224346-2), LFM-99-05A-FAL22 (680-224346-3) and LFM-99-06A-RP-FAL22 (680-224346-4).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

HPLC/IC

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry

Method 2320B: The laboratory control sample (LCS) for analytical batch 680-749724 recovered outside control limits for the following analytes: Alkalinity. Samples were not reprepared due to holding time. Instrument probe hit LCSD sample container, causing it to stop.

Method 353.2_Pres: The method blank for analytical batch 280-593201 contained Nitrate and Nitrite above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

Method 9012B_DOD5: The matrix spike / matrix spike duplicate (MS/MSD) recoveries and precision for preparation batch 680-749684 and analytical batch 680-749845 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample / laboratory sample control duplicate (LCS/LCSD) precision was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Client Sample ID: DCL-DUP01-FAL22

Lab Sample ID: 680-224346-1

Date Collected: 10/27/22 11:15

Matrix: Water

Date Received: 10/29/22 09:45

Method: MA DEP MAVPH2.1 - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C5-C8 Aliphatics (adjusted)	9.7	J	100	3.0	0.55	ug/L		11/08/22 15:18	1
C9-C12 Aliphatics (adjusted)	3.0	U	100	3.0	1.9	ug/L		11/08/22 15:18	1
C9-C10 Aromatics	12	J	100	1.0	0.85	ug/L		11/08/22 15:18	1
Benzene	1.0	U	5.0	1.0	0.13	ug/L		11/08/22 15:18	1
Ethylbenzene	1.0	U	5.0	1.0	0.24	ug/L		11/08/22 15:18	1
Methyl tert-butyl ether	1.0	U	5.0	1.0	0.19	ug/L		11/08/22 15:18	1
Naphthalene	1.0	U	5.0	1.0	0.56	ug/L		11/08/22 15:18	1
Toluene	1.0	U	5.0	1.0	0.15	ug/L		11/08/22 15:18	1
m,p-Xylene	1.0	U	10	1.0	0.42	ug/L		11/08/22 15:18	1
o-Xylene	1.0	U	5.0	1.0	0.24	ug/L		11/08/22 15:18	1
Surrogate	%Recovery	Qualifier	Limits		Prepared		Analyzed	Dil Fac	
2,5-Dibromotoluene (fid)	86		70 - 130				11/08/22 15:18	1	
2,5-Dibromotoluene (pid)	84		70 - 130				11/08/22 15:18	1	

Method: SW846 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
4,4'-DDD	0.0042	U	0.052	0.0042	0.0021	ug/L		11/05/22 19:39	1
4,4'-DDE	0.0042	U M	0.052	0.0042	0.0010	ug/L		11/05/22 19:39	1
4,4'-DDT	0.0042	U	0.052	0.0042	0.0010	ug/L		11/05/22 19:39	1
Aldrin	0.0042	U M	0.052	0.0042	0.0021	ug/L		11/05/22 19:39	1
alpha-BHC	0.0042	U M	0.052	0.0042	0.0010	ug/L		11/05/22 19:39	1
beta-BHC	0.0042	U M	0.052	0.0042	0.0021	ug/L		11/05/22 19:39	1
delta-BHC	0.0042	U	0.052	0.0042	0.0021	ug/L		11/05/22 19:39	1
Dieldrin	0.0042	U	0.052	0.0042	0.0021	ug/L		11/05/22 19:39	1
Endosulfan I	0.0042	U	0.052	0.0042	0.0021	ug/L		11/05/22 19:39	1
Endosulfan II	0.0042	U	0.052	0.0042	0.0021	ug/L		11/05/22 19:39	1
Endosulfan sulfate	0.0042	U	0.052	0.0042	0.0021	ug/L		11/05/22 19:39	1
Endrin	0.0042	U Q	0.052	0.0042	0.0010	ug/L		11/05/22 19:39	1
Endrin aldehyde	0.017	U	0.052	0.017	0.0042	ug/L		11/05/22 19:39	1
Endrin ketone	0.017	U	0.052	0.017	0.0042	ug/L		11/05/22 19:39	1
gamma-BHC (Lindane)	0.0042	U	0.052	0.0042	0.0010	ug/L		11/05/22 19:39	1
Heptachlor	0.0042	U Q	0.052	0.0042	0.0010	ug/L		11/05/22 19:39	1
Heptachlor epoxide	0.0042	U	0.052	0.0042	0.0021	ug/L		11/05/22 19:39	1
Methoxychlor	0.0042	U	0.052	0.0042	0.0021	ug/L		11/05/22 19:39	1
Chlordane (technical)	0.42	U	0.52	0.42	0.17	ug/L		11/05/22 19:39	1
Toxaphene	0.84	U M	5.2	0.84	0.32	ug/L		11/05/22 19:39	1
Surrogate	%Recovery	Qualifier	Limits		Prepared		Analyzed	Dil Fac	
DCB Decachlorobiphenyl	110		14 - 130		11/03/22 17:37		11/05/22 19:39	1	
Tetrachloro-m-xylene	61		44 - 124		11/03/22 17:37		11/05/22 19:39	1	

Method: MA DEP MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acenaphthene	1.4	U M	4.8	1.4	0.38	ug/L		11/08/22 17:08	1
Acenaphthylene	1.4	U M	4.8	1.4	0.41	ug/L		11/08/22 17:08	1
Anthracene	1.4	U M	4.8	1.4	0.91	ug/L		11/08/22 17:08	1
Benzo[a]anthracene	3.8	U M	4.8	3.8	1.9	ug/L		11/08/22 17:08	1
Benzo[a]pyrene	4.8	U M	4.8	4.8	2.1	ug/L		11/08/22 17:08	1
Benzo[b]fluoranthene	3.8	U M	4.8	3.8	2.0	ug/L		11/08/22 17:08	1

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Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Client Sample ID: DCL-DUP01-FAL22

Lab Sample ID: 680-224346-1

Date Collected: 10/27/22 11:15

Matrix: Water

Date Received: 10/29/22 09:45

Method: MA DEP MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzo[g,h,i]perylene	4.8	U M	4.8	4.8	2.3	ug/L		11/08/22 17:08	1
Benzo[k]fluoranthene	3.8	U M	4.8	3.8	1.7	ug/L		11/08/22 17:08	1
C9-C18 Aliphatics	34	J M	95	29	28	ug/L		11/08/22 17:08	1
C19-C36 Aliphatics	60	J M B	95	30	14	ug/L		11/08/22 17:08	1
C11-C22 Aromatics (Adjusted)	65	U	95	65	53	ug/L		11/08/22 17:08	1
Chrysene	3.8	U M	4.8	3.8	1.6	ug/L		11/08/22 17:08	1
Dibenz(a,h)anthracene	4.8	U M	4.8	4.8	2.5	ug/L		11/08/22 17:08	1
Fluoranthene	3.8	U M	4.8	3.8	1.1	ug/L		11/08/22 17:08	1
Fluorene	1.4	U M	4.8	1.4	0.60	ug/L		11/08/22 17:08	1
Indeno[1,2,3-cd]pyrene	4.8	U M	4.8	4.8	2.4	ug/L		11/08/22 17:08	1
2-Methylnaphthalene	1.4	U M	4.8	1.4	0.45	ug/L		11/08/22 17:08	1
Naphthalene	1.4	U M	4.8	1.4	0.47	ug/L		11/08/22 17:08	1
Phenanthrene	1.4	U M	4.8	1.4	0.80	ug/L		11/08/22 17:08	1
Pyrene	3.8	U M	4.8	3.8	1.0	ug/L		11/08/22 17:08	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1-Chlorooctadecane (Surr)	61		40 - 140	11/04/22 09:59	11/08/22 17:08	1
o-Terphenyl (Surr)	61		40 - 140	11/04/22 09:59	11/08/22 17:08	1
2-Fluorobiphenyl (Surr)	93		40 - 140	11/04/22 09:59	11/08/22 17:08	1

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chloride	280	D	2.5	2.5	1.0	mg/L		11/24/22 06:37	5
Sulfate	14	D	5.0	5.0	2.0	mg/L		11/24/22 06:37	5

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	23		20	10	4.4	ug/L		11/03/22 19:14	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		11/03/22 19:14	1
Chromium	4.0	U	10	4.0	1.1	ug/L		11/03/22 19:14	1
Copper	10	U	20	10	3.2	ug/L		11/03/22 19:14	1
Iron	50	U	100	50	20	ug/L		11/03/22 19:14	1
Lead	20	U	40	20	6.6	ug/L		11/03/22 19:14	1
Manganese	2.9	J	10	5.0	1.3	ug/L		11/03/22 19:14	1
Selenium	20	U	25	20	10	ug/L		11/03/22 19:14	1
Silver	5.0	U	10	5.0	1.5	ug/L		11/03/22 19:14	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		11/03/22 17:29	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		11/04/22 14:55	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity (SM 2320B-2011)	81	Q	5.0	5.0	2.2	mg/L		11/09/22 18:24	1
Nitrate/Nitrite-N (MCAWW 353.2)	0.46	B	0.10	0.080	0.044	mg/L		11/11/22 11:20	1
Chemical Oxygen Demand (MCAWW 410.4)	17	J	20	20	8.7	mg/L		11/03/22 11:43	1

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Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Client Sample ID: DCL-DUP01-FAL22

Lab Sample ID: 680-224346-1

Date Collected: 10/27/22 11:15

Matrix: Water

Date Received: 10/29/22 09:45

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Cyanide, Total (EPA 9012B)	0.012		0.010	0.0050	0.0025	mg/L		11/09/22 15:59	1
Total Dissolved Solids (TDS) (SM 2540C)	620		10	9.9	4.7	mg/L		11/03/22 12:16	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Client Sample ID: LFM-99-02B-FAL22

Lab Sample ID: 680-224346-2

Date Collected: 10/27/22 10:25

Matrix: Water

Date Received: 10/29/22 09:45

Method: MA DEP MAVPH2.1 - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C5-C8 Aliphatics (adjusted)	7.0	J	100	3.0	0.55	ug/L		11/08/22 16:04	1
C9-C12 Aliphatics (adjusted)	2.5	J	100	3.0	1.9	ug/L		11/08/22 16:04	1
C9-C10 Aromatics	11	J	100	1.0	0.85	ug/L		11/08/22 16:04	1
Benzene	1.0	U	5.0	1.0	0.13	ug/L		11/08/22 16:04	1
Ethylbenzene	1.0	U	5.0	1.0	0.24	ug/L		11/08/22 16:04	1
Methyl tert-butyl ether	1.0	U	5.0	1.0	0.19	ug/L		11/08/22 16:04	1
Naphthalene	1.0	U	5.0	1.0	0.56	ug/L		11/08/22 16:04	1
Toluene	1.0	U	5.0	1.0	0.15	ug/L		11/08/22 16:04	1
m,p-Xylene	1.0	U	10	1.0	0.42	ug/L		11/08/22 16:04	1
o-Xylene	1.0	U	5.0	1.0	0.24	ug/L		11/08/22 16:04	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,5-Dibromotoluene (fid)	91		70 - 130					11/08/22 16:04	1
2,5-Dibromotoluene (pid)	87		70 - 130					11/08/22 16:04	1

Method: SW846 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
4,4'-DDD	0.0037	U	0.047	0.0037	0.0019	ug/L		11/05/22 19:24	1
4,4'-DDE	0.0037	U	0.047	0.0037	0.00093	ug/L		11/05/22 19:24	1
4,4'-DDT	0.0037	U	0.047	0.0037	0.00093	ug/L		11/05/22 19:24	1
Aldrin	0.0037	U	0.047	0.0037	0.0019	ug/L		11/05/22 19:24	1
alpha-BHC	0.0037	U	0.047	0.0037	0.00093	ug/L		11/05/22 19:24	1
beta-BHC	0.0037	U M	0.047	0.0037	0.0019	ug/L		11/05/22 19:24	1
delta-BHC	0.0037	U	0.047	0.0037	0.0019	ug/L		11/05/22 19:24	1
Dieldrin	0.0037	U	0.047	0.0037	0.0019	ug/L		11/05/22 19:24	1
Endosulfan I	0.0037	U	0.047	0.0037	0.0019	ug/L		11/05/22 19:24	1
Endosulfan II	0.0037	U	0.047	0.0037	0.0019	ug/L		11/05/22 19:24	1
Endosulfan sulfate	0.0037	U	0.047	0.0037	0.0019	ug/L		11/05/22 19:24	1
Endrin	0.0037	U Q	0.047	0.0037	0.00093	ug/L		11/05/22 19:24	1
Endrin aldehyde	0.015	U	0.047	0.015	0.0037	ug/L		11/05/22 19:24	1
Endrin ketone	0.015	U	0.047	0.015	0.0037	ug/L		11/05/22 19:24	1
gamma-BHC (Lindane)	0.0037	U	0.047	0.0037	0.00093	ug/L		11/05/22 19:24	1
Heptachlor	0.0037	U Q	0.047	0.0037	0.00093	ug/L		11/05/22 19:24	1
Heptachlor epoxide	0.0037	U	0.047	0.0037	0.0019	ug/L		11/05/22 19:24	1
Methoxychlor	0.0037	U	0.047	0.0037	0.0019	ug/L		11/05/22 19:24	1
Chlordane (technical)	0.37	U	0.47	0.37	0.15	ug/L		11/05/22 19:24	1
Toxaphene	0.74	U	4.7	0.74	0.29	ug/L		11/05/22 19:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	96		14 - 130				11/03/22 17:37	11/05/22 19:24	1
Tetrachloro-m-xylene	61		44 - 124				11/03/22 17:37	11/05/22 19:24	1

Method: MA DEP MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acenaphthene	1.4	U M	4.8	1.4	0.38	ug/L		11/08/22 17:38	1
Acenaphthylene	1.4	U M	4.8	1.4	0.41	ug/L		11/08/22 17:38	1
Anthracene	1.4	U M	4.8	1.4	0.91	ug/L		11/08/22 17:38	1
Benzo[a]anthracene	3.8	U M	4.8	3.8	1.9	ug/L		11/08/22 17:38	1
Benzo[a]pyrene	4.8	U M	4.8	4.8	2.1	ug/L		11/08/22 17:38	1
Benzo[b]fluoranthene	3.8	U M	4.8	3.8	2.0	ug/L		11/08/22 17:38	1

Eurofins Savannah

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Client Sample ID: LFM-99-02B-FAL22

Lab Sample ID: 680-224346-2

Date Collected: 10/27/22 10:25

Matrix: Water

Date Received: 10/29/22 09:45

Method: MA DEP MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzo[g,h,i]perylene	4.8	U M	4.8	4.8	2.3	ug/L		11/08/22 17:38	1
Benzo[k]fluoranthene	3.8	U M	4.8	3.8	1.7	ug/L		11/08/22 17:38	1
C9-C18 Aliphatics	34	J	95	29	28	ug/L		11/08/22 17:38	1
C19-C36 Aliphatics	54	J M B	95	30	14	ug/L		11/08/22 17:38	1
C11-C22 Aromatics (Adjusted)	65	U	95	65	53	ug/L		11/08/22 17:38	1
Chrysene	3.8	U M	4.8	3.8	1.6	ug/L		11/08/22 17:38	1
Dibenz(a,h)anthracene	4.8	U M	4.8	4.8	2.5	ug/L		11/08/22 17:38	1
Fluoranthene	3.8	U M	4.8	3.8	1.1	ug/L		11/08/22 17:38	1
Fluorene	1.4	U M	4.8	1.4	0.60	ug/L		11/08/22 17:38	1
Indeno[1,2,3-cd]pyrene	4.8	U M	4.8	4.8	2.4	ug/L		11/08/22 17:38	1
2-Methylnaphthalene	1.4	U M	4.8	1.4	0.45	ug/L		11/08/22 17:38	1
Naphthalene	1.4	U M J1	4.8	1.4	0.47	ug/L		11/08/22 17:38	1
Phenanthrene	1.4	U M	4.8	1.4	0.80	ug/L		11/08/22 17:38	1
Pyrene	3.8	U M	4.8	3.8	1.0	ug/L		11/08/22 17:38	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1-Chlorooctadecane (Surr)	42		40 - 140	11/04/22 09:59	11/08/22 17:38	1
o-Terphenyl (Surr)	60		40 - 140	11/04/22 09:59	11/08/22 17:38	1
2-Fluorobiphenyl (Surr)	92		40 - 140	11/04/22 09:59	11/08/22 17:38	1

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chloride	150	D	2.5	2.5	1.0	mg/L		11/24/22 06:51	5
Sulfate	17	D	5.0	5.0	2.0	mg/L		11/24/22 06:51	5

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	6.6	J	20	10	4.4	ug/L		11/03/22 18:59	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		11/03/22 18:59	1
Chromium	4.0	U	10	4.0	1.1	ug/L		11/03/22 18:59	1
Copper	10	U	20	10	3.2	ug/L		11/03/22 18:59	1
Iron	50	U	100	50	20	ug/L		11/03/22 18:59	1
Lead	20	U	40	20	6.6	ug/L		11/03/22 18:59	1
Manganese	2.3	J	10	5.0	1.3	ug/L		11/03/22 18:59	1
Selenium	20	U	25	20	10	ug/L		11/03/22 18:59	1
Silver	5.0	U	10	5.0	1.5	ug/L		11/03/22 18:59	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		11/03/22 17:15	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		11/04/22 14:58	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity (SM 2320B-2011)	120		5.0	5.0	2.2	mg/L		11/09/22 13:02	1
Nitrate Nitrite as N (MCAWW 353.2-1993 R2.0)	0.53		0.050	0.025	0.010	mg/L		11/08/22 16:12	1

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Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Client Sample ID: LFM-99-02B-FAL22

Lab Sample ID: 680-224346-2

Date Collected: 10/27/22 10:25

Matrix: Water

Date Received: 10/29/22 09:45

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chemical Oxygen Demand (MCAWW 410.4)	14	J J1	20	20	8.7	mg/L		11/03/22 11:43	1
Cyanide, Total (EPA 9012B)	0.0064	J J1	0.010	0.0050	0.0025	mg/L		11/09/22 15:58	1
Total Dissolved Solids (TDS) (SM 2540C)	390		10	9.9	4.7	mg/L		11/03/22 12:16	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Client Sample ID: LFM-99-05A-FAL22

Lab Sample ID: 680-224346-3

Date Collected: 10/27/22 11:15

Matrix: Water

Date Received: 10/29/22 09:45

Method: MA DEP MAVPH2.1 - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C5-C8 Aliphatics (adjusted)	7.3	J	100	3.0	0.55	ug/L		11/08/22 16:42	1
C9-C12 Aliphatics (adjusted)	3.0	U	100	3.0	1.9	ug/L		11/08/22 16:42	1
C9-C10 Aromatics	10	J	100	1.0	0.85	ug/L		11/08/22 16:42	1
Benzene	1.0	U	5.0	1.0	0.13	ug/L		11/08/22 16:42	1
Ethylbenzene	1.0	U	5.0	1.0	0.24	ug/L		11/08/22 16:42	1
Methyl tert-butyl ether	1.0	U	5.0	1.0	0.19	ug/L		11/08/22 16:42	1
Naphthalene	1.0	U	5.0	1.0	0.56	ug/L		11/08/22 16:42	1
Toluene	1.0	U M	5.0	1.0	0.15	ug/L		11/08/22 16:42	1
m,p-Xylene	1.0	U	10	1.0	0.42	ug/L		11/08/22 16:42	1
o-Xylene	1.0	U	5.0	1.0	0.24	ug/L		11/08/22 16:42	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,5-Dibromotoluene (fid)	121		70 - 130					11/08/22 16:42	1
2,5-Dibromotoluene (pid)	116		70 - 130					11/08/22 16:42	1

Method: SW846 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
4,4'-DDD	0.0037	U	0.046	0.0037	0.0018	ug/L		11/05/22 19:54	1
4,4'-DDE	0.0037	U	0.046	0.0037	0.00092	ug/L		11/05/22 19:54	1
4,4'-DDT	0.0037	U	0.046	0.0037	0.00092	ug/L		11/05/22 19:54	1
Aldrin	0.0037	U M	0.046	0.0037	0.0018	ug/L		11/05/22 19:54	1
alpha-BHC	0.0037	U	0.046	0.0037	0.00092	ug/L		11/05/22 19:54	1
beta-BHC	0.0037	U	0.046	0.0037	0.0018	ug/L		11/05/22 19:54	1
delta-BHC	0.0037	U	0.046	0.0037	0.0018	ug/L		11/05/22 19:54	1
Dieldrin	0.0037	U	0.046	0.0037	0.0018	ug/L		11/05/22 19:54	1
Endosulfan I	0.0037	U	0.046	0.0037	0.0018	ug/L		11/05/22 19:54	1
Endosulfan II	0.0037	U	0.046	0.0037	0.0018	ug/L		11/05/22 19:54	1
Endosulfan sulfate	0.0037	U M	0.046	0.0037	0.0018	ug/L		11/05/22 19:54	1
Endrin	0.0037	U Q	0.046	0.0037	0.00092	ug/L		11/05/22 19:54	1
Endrin aldehyde	0.015	U	0.046	0.015	0.0037	ug/L		11/05/22 19:54	1
Endrin ketone	0.015	U	0.046	0.015	0.0037	ug/L		11/05/22 19:54	1
gamma-BHC (Lindane)	0.0037	U	0.046	0.0037	0.00092	ug/L		11/05/22 19:54	1
Heptachlor	0.0037	U Q	0.046	0.0037	0.00092	ug/L		11/05/22 19:54	1
Heptachlor epoxide	0.0037	U	0.046	0.0037	0.0018	ug/L		11/05/22 19:54	1
Methoxychlor	0.0037	U	0.046	0.0037	0.0018	ug/L		11/05/22 19:54	1
Chlordane (technical)	0.37	U	0.46	0.37	0.15	ug/L		11/05/22 19:54	1
Toxaphene	0.74	U	4.6	0.74	0.29	ug/L		11/05/22 19:54	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	106		14 - 130				11/03/22 17:37	11/05/22 19:54	1
Tetrachloro-m-xylene	59		44 - 124				11/03/22 17:37	11/05/22 19:54	1

Method: MA DEP MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acenaphthene	1.4	U M	4.8	1.4	0.38	ug/L		11/08/22 19:09	1
Acenaphthylene	1.4	U M	4.8	1.4	0.41	ug/L		11/08/22 19:09	1
Anthracene	1.4	U M	4.8	1.4	0.91	ug/L		11/08/22 19:09	1
Benzo[a]anthracene	3.8	U M	4.8	3.8	1.9	ug/L		11/08/22 19:09	1
Benzo[a]pyrene	4.8	U M	4.8	4.8	2.1	ug/L		11/08/22 19:09	1
Benzo[b]fluoranthene	3.8	U M	4.8	3.8	2.0	ug/L		11/08/22 19:09	1

Eurofins Savannah

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Client Sample ID: LFM-99-05A-FAL22

Lab Sample ID: 680-224346-3

Date Collected: 10/27/22 11:15

Matrix: Water

Date Received: 10/29/22 09:45

Method: MA DEP MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzo[g,h,i]perylene	4.8	U M	4.8	4.8	2.3	ug/L		11/08/22 19:09	1
Benzo[k]fluoranthene	3.8	U M	4.8	3.8	1.7	ug/L		11/08/22 19:09	1
C9-C18 Aliphatics	36	J	95	29	28	ug/L		11/08/22 19:09	1
C19-C36 Aliphatics	35	J M B	95	30	14	ug/L		11/08/22 19:09	1
C11-C22 Aromatics (Adjusted)	65	U	95	65	53	ug/L		11/08/22 19:09	1
Chrysene	3.8	U M	4.8	3.8	1.6	ug/L		11/08/22 19:09	1
Dibenz(a,h)anthracene	4.8	U M	4.8	4.8	2.5	ug/L		11/08/22 19:09	1
Fluoranthene	3.8	U M	4.8	3.8	1.1	ug/L		11/08/22 19:09	1
Fluorene	1.4	U M	4.8	1.4	0.60	ug/L		11/08/22 19:09	1
Indeno[1,2,3-cd]pyrene	4.8	U M	4.8	4.8	2.4	ug/L		11/08/22 19:09	1
2-Methylnaphthalene	1.4	U M	4.8	1.4	0.45	ug/L		11/08/22 19:09	1
Naphthalene	1.4	U M	4.8	1.4	0.47	ug/L		11/08/22 19:09	1
Phenanthrene	1.4	U M	4.8	1.4	0.80	ug/L		11/08/22 19:09	1
Pyrene	3.8	U M	4.8	3.8	1.0	ug/L		11/08/22 19:09	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1-Chlorooctadecane (Surr)	67		40 - 140	11/04/22 09:59	11/08/22 19:09	1
o-Terphenyl (Surr)	63		40 - 140	11/04/22 09:59	11/08/22 19:09	1
2-Fluorobiphenyl (Surr)	98		40 - 140	11/04/22 09:59	11/08/22 19:09	1

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chloride	270	D	1.0	1.0	0.40	mg/L		11/24/22 07:30	2
Sulfate	16	D	2.0	2.0	0.80	mg/L		11/24/22 07:30	2

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	21		20	10	4.4	ug/L		11/03/22 19:17	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		11/03/22 19:17	1
Chromium	4.0	U	10	4.0	1.1	ug/L		11/03/22 19:17	1
Copper	10	U	20	10	3.2	ug/L		11/03/22 19:17	1
Iron	50	U	100	50	20	ug/L		11/03/22 19:17	1
Lead	20	U	40	20	6.6	ug/L		11/03/22 19:17	1
Manganese	5.0	U	10	5.0	1.3	ug/L		11/03/22 19:17	1
Selenium	20	U	25	20	10	ug/L		11/03/22 19:17	1
Silver	5.0	U	10	5.0	1.5	ug/L		11/03/22 19:17	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	1.2	J	5.0	3.0	0.86	ug/L		11/03/22 17:31	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		11/04/22 15:05	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity (SM 2320B-2011)	82		5.0	5.0	2.2	mg/L		11/09/22 12:47	1
Nitrate Nitrite as N (MCAWW 353.2-1993 R2.0)	0.33		0.050	0.025	0.010	mg/L		11/08/22 16:18	1

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Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Client Sample ID: LFM-99-05A-FAL22

Lab Sample ID: 680-224346-3

Date Collected: 10/27/22 11:15

Matrix: Water

Date Received: 10/29/22 09:45

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chemical Oxygen Demand (MCAWW 410.4)	16	J	20	20	8.7	mg/L		11/03/22 11:43	1
Cyanide, Total (EPA 9012B)	0.0050	U	0.010	0.0050	0.0025	mg/L		11/09/22 15:59	1
Total Dissolved Solids (TDS) (SM 2540C)	610		10	9.9	4.7	mg/L		11/03/22 12:16	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Client Sample ID: LFM-99-06A-RP-FAL22

Lab Sample ID: 680-224346-4

Date Collected: 10/27/22 10:10

Matrix: Water

Date Received: 10/29/22 09:45

Method: MA DEP MAVPH2.1 - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C5-C8 Aliphatics (adjusted)	6.7	J	100	3.0	0.55	ug/L		11/08/22 17:20	1
C9-C12 Aliphatics (adjusted)	3.0	U	100	3.0	1.9	ug/L		11/08/22 17:20	1
C9-C10 Aromatics	12	J	100	1.0	0.85	ug/L		11/08/22 17:20	1
Benzene	1.0	U	5.0	1.0	0.13	ug/L		11/08/22 17:20	1
Ethylbenzene	1.0	U	5.0	1.0	0.24	ug/L		11/08/22 17:20	1
Methyl tert-butyl ether	1.0	U	5.0	1.0	0.19	ug/L		11/08/22 17:20	1
Naphthalene	1.0	U	5.0	1.0	0.56	ug/L		11/08/22 17:20	1
Toluene	1.0	U	5.0	1.0	0.15	ug/L		11/08/22 17:20	1
m,p-Xylene	1.0	U	10	1.0	0.42	ug/L		11/08/22 17:20	1
o-Xylene	1.0	U	5.0	1.0	0.24	ug/L		11/08/22 17:20	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,5-Dibromotoluene (fid)	112		70 - 130					11/08/22 17:20	1
2,5-Dibromotoluene (pid)	107		70 - 130					11/08/22 17:20	1

Method: SW846 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
4,4'-DDD	0.0036	U	0.046	0.0036	0.0018	ug/L		11/05/22 20:09	1
4,4'-DDE	0.0036	U	0.046	0.0036	0.00091	ug/L		11/05/22 20:09	1
4,4'-DDT	0.0036	U M	0.046	0.0036	0.00091	ug/L		11/05/22 20:09	1
Aldrin	0.0036	U	0.046	0.0036	0.0018	ug/L		11/05/22 20:09	1
alpha-BHC	0.0036	U	0.046	0.0036	0.00091	ug/L		11/05/22 20:09	1
beta-BHC	0.0036	U	0.046	0.0036	0.0018	ug/L		11/05/22 20:09	1
delta-BHC	0.0036	U	0.046	0.0036	0.0018	ug/L		11/05/22 20:09	1
Dieldrin	0.0036	U	0.046	0.0036	0.0018	ug/L		11/05/22 20:09	1
Endosulfan I	0.0036	U	0.046	0.0036	0.0018	ug/L		11/05/22 20:09	1
Endosulfan II	0.0036	U	0.046	0.0036	0.0018	ug/L		11/05/22 20:09	1
Endosulfan sulfate	0.0036	U M	0.046	0.0036	0.0018	ug/L		11/05/22 20:09	1
Endrin	0.0036	U Q	0.046	0.0036	0.00091	ug/L		11/05/22 20:09	1
Endrin aldehyde	0.015	U	0.046	0.015	0.0036	ug/L		11/05/22 20:09	1
Endrin ketone	0.015	U	0.046	0.015	0.0036	ug/L		11/05/22 20:09	1
gamma-BHC (Lindane)	0.0036	U	0.046	0.0036	0.00091	ug/L		11/05/22 20:09	1
Heptachlor	0.0036	U Q	0.046	0.0036	0.00091	ug/L		11/05/22 20:09	1
Heptachlor epoxide	0.0036	U	0.046	0.0036	0.0018	ug/L		11/05/22 20:09	1
Methoxychlor	0.0036	U M	0.046	0.0036	0.0018	ug/L		11/05/22 20:09	1
Chlordane (technical)	0.36	U	0.46	0.36	0.15	ug/L		11/05/22 20:09	1
Toxaphene	0.73	U M	4.6	0.73	0.28	ug/L		11/05/22 20:09	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	99		14 - 130				11/03/22 17:37	11/05/22 20:09	1
Tetrachloro-m-xylene	61		44 - 124				11/03/22 17:37	11/05/22 20:09	1

Method: MA DEP MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acenaphthene	1.4	U M	4.8	1.4	0.38	ug/L		11/08/22 19:39	1
Acenaphthylene	1.4	U M	4.8	1.4	0.41	ug/L		11/08/22 19:39	1
Anthracene	1.4	U M	4.8	1.4	0.91	ug/L		11/08/22 19:39	1
Benzo[a]anthracene	3.8	U M	4.8	3.8	1.9	ug/L		11/08/22 19:39	1
Benzo[a]pyrene	4.8	U M	4.8	4.8	2.1	ug/L		11/08/22 19:39	1
Benzo[b]fluoranthene	3.8	U M	4.8	3.8	2.0	ug/L		11/08/22 19:39	1

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Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Client Sample ID: LFM-99-06A-RP-FAL22

Lab Sample ID: 680-224346-4

Date Collected: 10/27/22 10:10

Matrix: Water

Date Received: 10/29/22 09:45

Method: MA DEP MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzo[g,h,i]perylene	4.8	U M	4.8	4.8	2.3	ug/L		11/08/22 19:39	1
Benzo[k]fluoranthene	3.8	U M	4.8	3.8	1.7	ug/L		11/08/22 19:39	1
C9-C18 Aliphatics	37	J	95	29	28	ug/L		11/08/22 19:39	1
C19-C36 Aliphatics	46	J M B	95	30	14	ug/L		11/08/22 19:39	1
C11-C22 Aromatics (Adjusted)	65	U	95	65	53	ug/L		11/08/22 19:39	1
Chrysene	3.8	U M	4.8	3.8	1.6	ug/L		11/08/22 19:39	1
Dibenz(a,h)anthracene	4.8	U M	4.8	4.8	2.5	ug/L		11/08/22 19:39	1
Fluoranthene	3.8	U M	4.8	3.8	1.1	ug/L		11/08/22 19:39	1
Fluorene	1.4	U M	4.8	1.4	0.60	ug/L		11/08/22 19:39	1
Indeno[1,2,3-cd]pyrene	4.8	U M	4.8	4.8	2.4	ug/L		11/08/22 19:39	1
2-Methylnaphthalene	1.4	U M	4.8	1.4	0.45	ug/L		11/08/22 19:39	1
Naphthalene	1.4	U M	4.8	1.4	0.47	ug/L		11/08/22 19:39	1
Phenanthrene	1.4	U M	4.8	1.4	0.80	ug/L		11/08/22 19:39	1
Pyrene	3.8	U M	4.8	3.8	1.0	ug/L		11/08/22 19:39	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1-Chlorooctadecane (Surr)	55		40 - 140	11/04/22 09:59	11/08/22 19:39	1
o-Terphenyl (Surr)	54		40 - 140	11/04/22 09:59	11/08/22 19:39	1
2-Fluorobiphenyl (Surr)	87		40 - 140	11/04/22 09:59	11/08/22 19:39	1

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chloride	270	D	2.5	2.5	1.0	mg/L		11/24/22 07:44	5
Sulfate	24	D	5.0	5.0	2.0	mg/L		11/24/22 07:44	5

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	5.8	J	20	10	4.4	ug/L		11/03/22 19:20	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		11/03/22 19:20	1
Chromium	4.0	U	10	4.0	1.1	ug/L		11/03/22 19:20	1
Copper	10	U	20	10	3.2	ug/L		11/03/22 19:20	1
Iron	50	U	100	50	20	ug/L		11/03/22 19:20	1
Lead	20	U	40	20	6.6	ug/L		11/03/22 19:20	1
Manganese	5.0	U	10	5.0	1.3	ug/L		11/03/22 19:20	1
Selenium	20	U	25	20	10	ug/L		11/03/22 19:20	1
Silver	5.0	U	10	5.0	1.5	ug/L		11/03/22 19:20	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		11/03/22 17:34	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		11/04/22 15:08	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity (SM 2320B-2011)	120		5.0	5.0	2.2	mg/L		11/09/22 14:56	1
Nitrate Nitrite as N (MCAWW 353.2-1993 R2.0)	0.73		0.050	0.025	0.010	mg/L		11/08/22 16:27	1

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Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Client Sample ID: LFM-99-06A-RP-FAL22

Lab Sample ID: 680-224346-4

Date Collected: 10/27/22 10:10

Matrix: Water

Date Received: 10/29/22 09:45

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chemical Oxygen Demand (MCAWW 410.4)	15	J	20	20	8.7	mg/L		11/03/22 11:43	1
Cyanide, Total (EPA 9012B)	0.0035	J	0.010	0.0050	0.0025	mg/L		11/09/22 15:59	1
Total Dissolved Solids (TDS) (SM 2540C)	600		10	9.9	4.7	mg/L		11/03/22 12:16	1

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Method: MAVPH2.1 - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Lab Sample ID: MB 620-17188/6
Matrix: Water
Analysis Batch: 17188

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB MB		LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
C5-C8 Aliphatics (adjusted)	10.2	J	100	3.0	0.55	ug/L		11/08/22 13:12	1
C9-C12 Aliphatics (adjusted)	2.09	J	100	3.0	1.9	ug/L		11/08/22 13:12	1
C9-C10 Aromatics	10.4	J	100	1.0	0.85	ug/L		11/08/22 13:12	1
Benzene	1.0	U	5.0	1.0	0.13	ug/L		11/08/22 13:12	1
Ethylbenzene	1.0	U	5.0	1.0	0.24	ug/L		11/08/22 13:12	1
Methyl tert-butyl ether	1.0	U	5.0	1.0	0.19	ug/L		11/08/22 13:12	1
Naphthalene	1.0	U M	5.0	1.0	0.56	ug/L		11/08/22 13:12	1
Toluene	1.0	U	5.0	1.0	0.15	ug/L		11/08/22 13:12	1
m,p-Xylene	1.0	U	10	1.0	0.42	ug/L		11/08/22 13:12	1
o-Xylene	1.0	U	5.0	1.0	0.24	ug/L		11/08/22 13:12	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
2,5-Dibromotoluene (fid)	116		70 - 130		11/08/22 13:12	1
2,5-Dibromotoluene (pid)	111		70 - 130		11/08/22 13:12	1

Lab Sample ID: LCS 620-17188/3
Matrix: Water
Analysis Batch: 17188

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
C9-C10 Aromatics	20.0	19.6	J	ug/L		98	70 - 130
Benzene	20.0	20.3		ug/L		101	70 - 130
Ethylbenzene	20.0	20.2		ug/L		101	70 - 130
Methyl tert-butyl ether	20.0	19.6		ug/L		98	70 - 130
Naphthalene	20.0	17.5		ug/L		88	70 - 130
Toluene	20.0	20.4		ug/L		102	70 - 130
m,p-Xylene	40.0	40.7		ug/L		102	70 - 130
o-Xylene	20.0	20.3		ug/L		102	70 - 130

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
2,5-Dibromotoluene (fid)	115		70 - 130
2,5-Dibromotoluene (pid)	111		70 - 130

Lab Sample ID: LCSD 620-17188/4
Matrix: Water
Analysis Batch: 17188

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD LCSD		Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
		Result	Qualifier						
C9-C10 Aromatics	20.0	19.2	J	ug/L		96	70 - 130	2	25
Benzene	20.0	19.4		ug/L		97	70 - 130	5	25
Ethylbenzene	20.0	19.3		ug/L		97	70 - 130	4	25
Methyl tert-butyl ether	20.0	19.4		ug/L		97	70 - 130	1	25
Naphthalene	20.0	18.6		ug/L		93	70 - 130	6	25
Toluene	20.0	19.4		ug/L		97	70 - 130	5	25
m,p-Xylene	40.0	39.3		ug/L		98	70 - 130	4	25
o-Xylene	20.0	19.8		ug/L		99	70 - 130	3	25

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Method: MAVPH2.1 - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCSD 620-17188/4
Matrix: Water
Analysis Batch: 17188

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Surrogate	LCSD LCSD		Limits
	%Recovery	Qualifier	
2,5-Dibromotoluene (fid)	121		70 - 130
2,5-Dibromotoluene (pid)	115		70 - 130

Lab Sample ID: MB 620-17232/6
Matrix: Water
Analysis Batch: 17232

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB MB		LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
C5-C8 Aliphatics (adjusted)	9.12	J	100	3.0	0.55	ug/L		11/09/22 15:07	1
C9-C12 Aliphatics (adjusted)	2.72	J	100	3.0	1.9	ug/L		11/09/22 15:07	1
C9-C10 Aromatics	10.8	J	100	1.0	0.85	ug/L		11/09/22 15:07	1
Benzene	1.0	U	5.0	1.0	0.13	ug/L		11/09/22 15:07	1
Ethylbenzene	1.0	U	5.0	1.0	0.24	ug/L		11/09/22 15:07	1
Methyl tert-butyl ether	1.0	U	5.0	1.0	0.19	ug/L		11/09/22 15:07	1
Naphthalene	1.0	U M	5.0	1.0	0.56	ug/L		11/09/22 15:07	1
Toluene	1.0	U	5.0	1.0	0.15	ug/L		11/09/22 15:07	1
m,p-Xylene	1.0	U	10	1.0	0.42	ug/L		11/09/22 15:07	1
o-Xylene	1.0	U	5.0	1.0	0.24	ug/L		11/09/22 15:07	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
2,5-Dibromotoluene (fid)	117		70 - 130		11/09/22 15:07	1
2,5-Dibromotoluene (pid)	112		70 - 130		11/09/22 15:07	1

Lab Sample ID: LCS 620-17232/3
Matrix: Water
Analysis Batch: 17232

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
C9-C10 Aromatics	20.0	20.8	J	ug/L		104	70 - 130
Benzene	20.0	22.0		ug/L		110	70 - 130
Ethylbenzene	20.0	21.6		ug/L		108	70 - 130
Methyl tert-butyl ether	20.0	20.9		ug/L		104	70 - 130
Naphthalene	20.0	15.5		ug/L		78	70 - 130
Toluene	20.0	22.1		ug/L		110	70 - 130
m,p-Xylene	40.0	43.5		ug/L		109	70 - 130
o-Xylene	20.0	21.8		ug/L		109	70 - 130

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
2,5-Dibromotoluene (fid)	98		70 - 130
2,5-Dibromotoluene (pid)	95		70 - 130

Lab Sample ID: LCSD 620-17232/4
Matrix: Water
Analysis Batch: 17232

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD LCSD		Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
		Result	Qualifier						
C9-C10 Aromatics	20.0	19.6	J	ug/L		98	70 - 130	6	25
Benzene	20.0	19.9		ug/L		100	70 - 130	10	25

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Method: MAVPH2.1 - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCSD 620-17232/4
Matrix: Water
Analysis Batch: 17232

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Ethylbenzene	20.0	20.1		ug/L		100	70 - 130	7	25
Methyl tert-butyl ether	20.0	21.1		ug/L		106	70 - 130	1	25
Naphthalene	20.0	19.4		ug/L		97	70 - 130	22	25
Toluene	20.0	20.0		ug/L		100	70 - 130	10	25
m,p-Xylene	40.0	40.6		ug/L		101	70 - 130	7	25
o-Xylene	20.0	20.3		ug/L		102	70 - 130	7	25

Surrogate	LCSD %Recovery	LCSD Qualifier	LCSD Limits
2,5-Dibromotoluene (fid)	123		70 - 130
2,5-Dibromotoluene (pid)	119		70 - 130

Lab Sample ID: 680-224346-2 MS
Matrix: Water
Analysis Batch: 17232

Client Sample ID: LFM-99-02B-FAL22
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
C9-C10 Aromatics	11	J	20.3	37.2	J	ug/L		130	70 - 130
Benzene	1.0	U	20.3	20.3		ug/L		100	70 - 130
Ethylbenzene	1.0	U	20.3	20.2		ug/L		99	70 - 130
Methyl tert-butyl ether	1.0	U	20.3	19.2		ug/L		94	70 - 130
Naphthalene	1.0	U	20.3	15.9		ug/L		78	70 - 130
Toluene	1.0	U	20.3	20.2		ug/L		99	70 - 130
m,p-Xylene	1.0	U	40.7	40.6		ug/L		100	70 - 130
o-Xylene	1.0	U	20.3	20.3		ug/L		100	70 - 130

Surrogate	MS %Recovery	MS Qualifier	MS Limits
2,5-Dibromotoluene (fid)	106		70 - 130
2,5-Dibromotoluene (pid)	102		70 - 130

Lab Sample ID: 680-224346-2 MSD
Matrix: Water
Analysis Batch: 17232

Client Sample ID: LFM-99-02B-FAL22
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
C9-C10 Aromatics	11	J	20.3	33.8	J	ug/L		114	70 - 130	10	30
Benzene	1.0	U	20.3	19.7		ug/L		97	70 - 130	3	30
Ethylbenzene	1.0	U	20.3	19.7		ug/L		97	70 - 130	3	30
Methyl tert-butyl ether	1.0	U	20.3	18.3		ug/L		90	70 - 130	5	30
Naphthalene	1.0	U	20.3	15.5		ug/L		76	70 - 130	3	30
Toluene	1.0	U	20.3	19.9		ug/L		98	70 - 130	2	30
m,p-Xylene	1.0	U	40.7	39.5		ug/L		97	70 - 130	3	30
o-Xylene	1.0	U	20.3	19.9		ug/L		98	70 - 130	2	30

Surrogate	MSD %Recovery	MSD Qualifier	MSD Limits
2,5-Dibromotoluene (fid)	105		70 - 130
2,5-Dibromotoluene (pid)	101		70 - 130

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Lab Sample ID: MB 680-748736/1-A
Matrix: Water
Analysis Batch: 749075

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 748736

Analyte	MB	MB	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
4,4'-DDD	0.0040	U	0.050	0.0040	0.0020	ug/L		11/05/22 17:55	1
4,4'-DDE	0.0040	U	0.050	0.0040	0.0010	ug/L		11/05/22 17:55	1
4,4'-DDT	0.0040	U	0.050	0.0040	0.0010	ug/L		11/05/22 17:55	1
Aldrin	0.0040	U	0.050	0.0040	0.0020	ug/L		11/05/22 17:55	1
alpha-BHC	0.0040	U	0.050	0.0040	0.0010	ug/L		11/05/22 17:55	1
beta-BHC	0.0040	U M	0.050	0.0040	0.0020	ug/L		11/05/22 17:55	1
delta-BHC	0.0040	U	0.050	0.0040	0.0020	ug/L		11/05/22 17:55	1
Dieldrin	0.0040	U	0.050	0.0040	0.0020	ug/L		11/05/22 17:55	1
Endosulfan I	0.0040	U	0.050	0.0040	0.0020	ug/L		11/05/22 17:55	1
Endosulfan II	0.0040	U	0.050	0.0040	0.0020	ug/L		11/05/22 17:55	1
Endosulfan sulfate	0.0040	U M	0.050	0.0040	0.0020	ug/L		11/05/22 17:55	1
Endrin	0.0040	U	0.050	0.0040	0.0010	ug/L		11/05/22 17:55	1
Endrin aldehyde	0.016	U	0.050	0.016	0.0040	ug/L		11/05/22 17:55	1
Endrin ketone	0.016	U	0.050	0.016	0.0040	ug/L		11/05/22 17:55	1
gamma-BHC (Lindane)	0.0040	U M	0.050	0.0040	0.0010	ug/L		11/05/22 17:55	1
Heptachlor	0.0040	U	0.050	0.0040	0.0010	ug/L		11/05/22 17:55	1
Heptachlor epoxide	0.0040	U	0.050	0.0040	0.0020	ug/L		11/05/22 17:55	1
Methoxychlor	0.0040	U	0.050	0.0040	0.0020	ug/L		11/05/22 17:55	1
Chlordane (technical)	0.40	U	0.50	0.40	0.16	ug/L		11/05/22 17:55	1
Toxaphene	0.80	U	5.0	0.80	0.31	ug/L		11/05/22 17:55	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
DCB Decachlorobiphenyl	83		14 - 130	11/03/22 17:37	11/05/22 17:55	1
Tetrachloro-m-xylene	52		44 - 124	11/03/22 17:37	11/05/22 17:55	1

Lab Sample ID: LCS 680-748736/2-A
Matrix: Water
Analysis Batch: 749075

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 748736

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
4,4'-DDD	0.0400	0.0437	J	ug/L		109	56 - 143
4,4'-DDE	0.0400	0.0379	J	ug/L		95	57 - 135
4,4'-DDT	0.0400	0.0383	J	ug/L		96	51 - 143
Aldrin	0.0400	0.0288	J	ug/L		72	45 - 134
alpha-BHC	0.0400	0.0285	J	ug/L		71	54 - 138
beta-BHC	0.0400	0.0366	J	ug/L		92	56 - 136
delta-BHC	0.0400	0.0308	J	ug/L		77	52 - 142
Dieldrin	0.0400	0.0373	J	ug/L		93	60 - 136
Endosulfan I	0.0400	0.0336	J	ug/L		84	62 - 126
Endosulfan II	0.0400	0.0302	J	ug/L		75	52 - 135
Endosulfan sulfate	0.0400	0.0379	J	ug/L		95	62 - 133
Endrin	0.0400	0.0452	J	ug/L		113	60 - 138
Endrin aldehyde	0.0400	0.0318	J	ug/L		79	51 - 132
Endrin ketone	0.0400	0.0348	J	ug/L		87	58 - 134
gamma-BHC (Lindane)	0.0400	0.0299	J	ug/L		75	59 - 134
Heptachlor	0.0400	0.0272	J	ug/L		68	54 - 130
Heptachlor epoxide	0.0400	0.0348	J	ug/L		87	61 - 133
Methoxychlor	0.0400	0.0395	J	ug/L		99	54 - 145

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC) (Continued)

Lab Sample ID: LCS 680-748736/2-A
Matrix: Water
Analysis Batch: 749075

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 748736

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
DCB Decachlorobiphenyl	63		14 - 130
Tetrachloro-m-xylene	58		44 - 124

Lab Sample ID: 680-224346-2 MS
Matrix: Water
Analysis Batch: 749075

Client Sample ID: LFM-99-02B-FAL22
Prep Type: Total/NA
Prep Batch: 748736

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec	Limits
	Result	Qualifier	Added	Result	Qualifier					
4,4'-DDD	0.0037	U	0.0393	0.0355	J	ug/L		90		56 - 143
4,4'-DDE	0.0037	U	0.0393	0.0454	J	ug/L		116		57 - 135
4,4'-DDT	0.0037	U	0.0393	0.0404	J	ug/L		103		51 - 143
Aldrin	0.0037	U	0.0393	0.0265	J	ug/L		67		45 - 134
alpha-BHC	0.0037	U	0.0393	0.0272	J	ug/L		69		54 - 138
beta-BHC	0.0037	U M	0.0393	0.0399	J	ug/L		102		56 - 136
delta-BHC	0.0037	U	0.0393	0.0311	J	ug/L		79		52 - 142
Dieldrin	0.0037	U	0.0393	0.0362	J	ug/L		92		60 - 136
Endosulfan I	0.0037	U	0.0393	0.0305	J	ug/L		78		62 - 126
Endosulfan II	0.0037	U	0.0393	0.0300	J	ug/L		76		52 - 135
Endosulfan sulfate	0.0037	U	0.0393	0.0392	J	ug/L		100		62 - 133
Endrin	0.0037	U Q	0.0393	0.0445	J	ug/L		113		60 - 138
Endrin aldehyde	0.015	U	0.0393	0.0345	J	ug/L		88		51 - 132
Endrin ketone	0.015	U	0.0393	0.0340	J	ug/L		86		58 - 134
gamma-BHC (Lindane)	0.0037	U	0.0393	0.0300	J	ug/L		76		59 - 134
Heptachlor	0.0037	U Q	0.0393	0.0274	J	ug/L		70		54 - 130
Heptachlor epoxide	0.0037	U	0.0393	0.0344	J	ug/L		87		61 - 133
Methoxychlor	0.0037	U	0.0393	0.0396	J	ug/L		101		54 - 145

Surrogate	MS MS		Limits
	%Recovery	Qualifier	
DCB Decachlorobiphenyl	86		14 - 130
Tetrachloro-m-xylene	52		44 - 124

Lab Sample ID: 680-224346-2 MSD
Matrix: Water
Analysis Batch: 749075

Client Sample ID: LFM-99-02B-FAL22
Prep Type: Total/NA
Prep Batch: 748736

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec	RPD	Limit
	Result	Qualifier	Added	Result	Qualifier						
4,4'-DDD	0.0037	U	0.0386	0.0395	J	ug/L		102		11	30
4,4'-DDE	0.0037	U	0.0386	0.0385	J	ug/L		100		17	30
4,4'-DDT	0.0037	U	0.0386	0.0360	J	ug/L		93		12	30
Aldrin	0.0037	U	0.0386	0.0248	J	ug/L		64		6	30
alpha-BHC	0.0037	U	0.0386	0.0261	J	ug/L		68		4	30
beta-BHC	0.0037	U M	0.0386	0.0359	J	ug/L		93		11	30
delta-BHC	0.0037	U	0.0386	0.0307	J	ug/L		80		1	30
Dieldrin	0.0037	U	0.0386	0.0365	J	ug/L		95		1	30
Endosulfan I	0.0037	U	0.0386	0.0314	J	ug/L		81		3	30
Endosulfan II	0.0037	U	0.0386	0.0315	J	ug/L		82		5	30
Endosulfan sulfate	0.0037	U	0.0386	0.0412	J	ug/L		107		5	30
Endrin	0.0037	U Q	0.0386	0.0467	J	ug/L		121		5	30

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC) (Continued)

Lab Sample ID: 680-224346-2 MSD

Matrix: Water

Analysis Batch: 749075

Client Sample ID: LFM-99-02B-FAL22

Prep Type: Total/NA

Prep Batch: 748736

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec	RPD	RPD
	Result	Qualifier	Added	Result	Qualifier				Limits	Limit	
Endrin aldehyde	0.015	U	0.0386	0.0371	J	ug/L		96	51 - 132	7	30
Endrin ketone	0.015	U	0.0386	0.0388	J	ug/L		100	58 - 134	13	30
gamma-BHC (Lindane)	0.0037	U	0.0386	0.0262	J	ug/L		68	59 - 134	14	30
Heptachlor	0.0037	U Q	0.0386	0.0229	J	ug/L		59	54 - 130	18	30
Heptachlor epoxide	0.0037	U	0.0386	0.0331	J	ug/L		86	61 - 133	4	30
Methoxychlor	0.0037	U	0.0386	0.0426	J	ug/L		110	54 - 145	7	30

Surrogate	MSD	MSD	Limits
	%Recovery	Qualifier	
DCB Decachlorobiphenyl	89		14 - 130
Tetrachloro-m-xylene	48		44 - 124

Method: MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Lab Sample ID: MB 620-17055/1-B

Matrix: Water

Analysis Batch: 17042

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 17055

Analyte	MB	MB	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Acenaphthene	1.5	U M	5.0	1.5	0.40	ug/L		11/04/22 19:38	1
Acenaphthylene	1.5	U M	5.0	1.5	0.43	ug/L		11/04/22 19:38	1
Anthracene	1.5	U M	5.0	1.5	0.95	ug/L		11/04/22 19:38	1
Benzo[a]anthracene	4.0	U M	5.0	4.0	2.0	ug/L		11/04/22 19:38	1
Benzo[a]pyrene	5.0	U M	5.0	5.0	2.2	ug/L		11/04/22 19:38	1
Benzo[b]fluoranthene	4.0	U M	5.0	4.0	2.1	ug/L		11/04/22 19:38	1
Benzo[g,h,i]perylene	5.0	U M	5.0	5.0	2.4	ug/L		11/04/22 19:38	1
Benzo[k]fluoranthene	4.0	U M	5.0	4.0	1.8	ug/L		11/04/22 19:38	1
C9-C18 Aliphatics	40.1	J	100	30	29	ug/L		11/04/22 19:38	1
C19-C36 Aliphatics	54.6	J M	100	32	14	ug/L		11/04/22 19:38	1
C11-C22 Aromatics (Adjusted)	68	U	100	68	55	ug/L		11/04/22 19:38	1
Chrysene	4.0	U M	5.0	4.0	1.7	ug/L		11/04/22 19:38	1
Dibenz(a,h)anthracene	5.0	U M	5.0	5.0	2.7	ug/L		11/04/22 19:38	1
Fluoranthene	4.0	U M	5.0	4.0	1.1	ug/L		11/04/22 19:38	1
Fluorene	1.5	U M	5.0	1.5	0.64	ug/L		11/04/22 19:38	1
Indeno[1,2,3-cd]pyrene	5.0	U M	5.0	5.0	2.5	ug/L		11/04/22 19:38	1
2-Methylnaphthalene	1.5	U M	5.0	1.5	0.47	ug/L		11/04/22 19:38	1
Naphthalene	1.5	U M	5.0	1.5	0.49	ug/L		11/04/22 19:38	1
Phenanthrene	1.5	U M	5.0	1.5	0.84	ug/L		11/04/22 19:38	1
Pyrene	4.0	U M	5.0	4.0	1.1	ug/L		11/04/22 19:38	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
1-Chlorooctadecane (Surr)	70		40 - 140	11/04/22 09:59	11/04/22 19:38	1
o-Terphenyl (Surr)	68		40 - 140	11/04/22 09:59	11/04/22 19:38	1
2-Fluorobiphenyl (Surr)	120		40 - 140	11/04/22 09:59	11/04/22 19:38	1

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Method: MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCS 620-17055/2-B
Matrix: Water
Analysis Batch: 17042

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 17055

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Acenaphthene	20.0	17.0		ug/L		85	40 - 140
Acenaphthylene	20.0	20.1		ug/L		100	40 - 140
Anthracene	20.0	16.9		ug/L		85	40 - 140
Benzo[a]anthracene	20.0	14.8		ug/L		74	40 - 140
Benzo[a]pyrene	20.0	17.7	M	ug/L		89	40 - 140
Benzo[b]fluoranthene	20.0	13.7	M	ug/L		68	40 - 140
Benzo[g,h,i]perylene	20.0	22.9		ug/L		114	40 - 140
Benzo[k]fluoranthene	20.0	19.1	M	ug/L		96	40 - 140
C9-C18 Aliphatics	120	97.1	J M	ug/L		81	40 - 140
C19-C36 Aliphatics	160	180	M	ug/L		113	40 - 140
Chrysene	20.0	22.2		ug/L		111	40 - 140
Dibenz(a,h)anthracene	20.0	21.5		ug/L		107	40 - 140
Fluoranthene	20.0	18.9		ug/L		95	40 - 140
Fluorene	20.0	16.2		ug/L		81	40 - 140
Indeno[1,2,3-cd]pyrene	20.0	14.3		ug/L		72	40 - 140
2-Methylnaphthalene	20.0	17.2		ug/L		86	40 - 140
Naphthalene	20.0	16.5		ug/L		82	40 - 140
Phenanthrene	20.0	12.7		ug/L		63	40 - 140
Pyrene	20.0	19.6		ug/L		98	40 - 140

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1-Chlorooctadecane (Surr)	64		40 - 140
o-Terphenyl (Surr)	81		40 - 140
2-Fluorobiphenyl (Surr)	119		40 - 140

Lab Sample ID: LCSD 620-17055/3-B
Matrix: Water
Analysis Batch: 17042

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 17055

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Acenaphthene	20.0	19.0		ug/L		95	40 - 140	11	25
Acenaphthylene	20.0	22.4		ug/L		112	40 - 140	11	25
Anthracene	20.0	18.3		ug/L		92	40 - 140	8	25
Benzo[a]anthracene	20.0	15.4		ug/L		77	40 - 140	4	25
Benzo[a]pyrene	20.0	21.6		ug/L		108	40 - 140	19	25
Benzo[b]fluoranthene	20.0	15.8	M	ug/L		79	40 - 140	14	25
Benzo[g,h,i]perylene	20.0	25.4		ug/L		127	40 - 140	10	25
Benzo[k]fluoranthene	20.0	24.4	M	ug/L		122	40 - 140	24	25
C9-C18 Aliphatics	120	114	M	ug/L		95	40 - 140	16	25
C19-C36 Aliphatics	160	202	M	ug/L		126	40 - 140	11	25
Chrysene	20.0	24.1		ug/L		120	40 - 140	8	25
Dibenz(a,h)anthracene	20.0	23.9		ug/L		119	40 - 140	11	25
Fluoranthene	20.0	19.9		ug/L		99	40 - 140	5	25
Fluorene	20.0	18.3		ug/L		91	40 - 140	12	25
Indeno[1,2,3-cd]pyrene	20.0	16.4		ug/L		82	40 - 140	13	25
2-Methylnaphthalene	20.0	19.3		ug/L		97	40 - 140	12	25
Naphthalene	20.0	18.2		ug/L		91	40 - 140	10	25
Phenanthrene	20.0	13.9		ug/L		69	40 - 140	9	25

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Method: MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCSD 620-17055/3-B
Matrix: Water
Analysis Batch: 17042

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 17055

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Pyrene	20.0	23.4		ug/L		117	40 - 140	18	25

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1-Chlorooctadecane (Surr)	74		40 - 140
o-Terphenyl (Surr)	89		40 - 140
2-Fluorobiphenyl (Surr)	123		40 - 140

Lab Sample ID: 680-224346-2 MS
Matrix: Water
Analysis Batch: 17166

Client Sample ID: LFM-99-02B-FAL22
Prep Type: Total/NA
Prep Batch: 17055

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Acenaphthene	1.4	U M	19.0	8.63		ug/L		45	40 - 140
Acenaphthylene	1.4	U M	19.0	11.9		ug/L		63	40 - 140
Anthracene	1.4	U M	19.0	13.4		ug/L		70	40 - 140
Benzo[a]anthracene	3.8	U M	19.0	11.0		ug/L		58	40 - 140
Benzo[a]pyrene	4.8	U M	19.0	16.3		ug/L		86	40 - 140
Benzo[b]fluoranthene	3.8	U M	19.0	10.7		ug/L		56	40 - 140
Benzo[g,h,i]perylene	4.8	U M	19.0	19.5		ug/L		102	40 - 140
Benzo[k]fluoranthene	3.8	U M	19.0	18.8		ug/L		99	40 - 140
C9-C18 Aliphatics	34	J	114	108	M	ug/L		65	40 - 140
C19-C36 Aliphatics	54	J M B	152	170	M	ug/L		76	40 - 140
Chrysene	3.8	U M	19.0	19.2		ug/L		101	40 - 140
Dibenz(a,h)anthracene	4.8	U M	19.0	16.8		ug/L		88	40 - 140
Fluoranthene	3.8	U M	19.0	16.3		ug/L		86	40 - 140
Fluorene	1.4	U M	19.0	11.2		ug/L		59	40 - 140
Indeno[1,2,3-cd]pyrene	4.8	U M	19.0	10.0		ug/L		53	40 - 140
2-Methylnaphthalene	1.4	U M	19.0	7.66		ug/L		40	40 - 140
Naphthalene	1.4	U M J1	19.0	5.87	M J1	ug/L		31	40 - 140
Phenanthrene	1.4	U M	19.0	7.73		ug/L		41	40 - 140
Pyrene	3.8	U M	19.0	16.5		ug/L		86	40 - 140

Surrogate	MS %Recovery	MS Qualifier	Limits
1-Chlorooctadecane (Surr)	58		40 - 140
o-Terphenyl (Surr)	59		40 - 140
2-Fluorobiphenyl (Surr)	101		40 - 140

Lab Sample ID: 680-224346-2 MSD
Matrix: Water
Analysis Batch: 17166

Client Sample ID: LFM-99-02B-FAL22
Prep Type: Total/NA
Prep Batch: 17055

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Acenaphthene	1.4	U M	19.0	12.1		ug/L		64	40 - 140	34	50
Acenaphthylene	1.4	U M	19.0	14.2		ug/L		75	40 - 140	18	50
Anthracene	1.4	U M	19.0	15.0		ug/L		79	40 - 140	11	50
Benzo[a]anthracene	3.8	U M	19.0	9.65		ug/L		51	40 - 140	13	50
Benzo[a]pyrene	4.8	U M	19.0	14.5		ug/L		76	40 - 140	12	50
Benzo[b]fluoranthene	3.8	U M	19.0	8.89	M	ug/L		47	40 - 140	18	50

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Method: MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: 680-224346-2 MSD
Matrix: Water
Analysis Batch: 17166

Client Sample ID: LFM-99-02B-FAL22
Prep Type: Total/NA
Prep Batch: 17055

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec	RPD	Limit
	Result	Qualifier		Result	Qualifier				Limits		
Benzo[g,h,i]perylene	4.8	U M	19.0	17.2		ug/L		90	40 - 140	12	50
Benzo[k]fluoranthene	3.8	U M	19.0	14.8	M	ug/L		78	40 - 140	24	50
C9-C18 Aliphatics	34	J	114	117		ug/L		73	40 - 140	8	50
C19-C36 Aliphatics	54	J M B	152	207	M	ug/L		100	40 - 140	19	50
Chrysene	3.8	U M	19.0	17.9		ug/L		94	40 - 140	7	50
Dibenz(a,h)anthracene	4.8	U M	19.0	14.1		ug/L		74	40 - 140	18	50
Fluoranthene	3.8	U M	19.0	16.9		ug/L		89	40 - 140	4	50
Fluorene	1.4	U M	19.0	11.5		ug/L		60	40 - 140	3	50
Indeno[1,2,3-cd]pyrene	4.8	U M	19.0	8.35		ug/L		44	40 - 140	18	50
2-Methylnaphthalene	1.4	U M	19.0	8.51		ug/L		45	40 - 140	11	50
Naphthalene	1.4	U M J1	19.0	8.11	M	ug/L		43	40 - 140	32	50
Phenanthrene	1.4	U M	19.0	8.84		ug/L		46	40 - 140	13	50
Pyrene	3.8	U M	19.0	17.1		ug/L		90	40 - 140	4	50

Surrogate	MSD	MSD	Limits
	%Recovery	Qualifier	
1-Chlorooctadecane (Surr)	54		40 - 140
o-Terphenyl (Surr)	64		40 - 140
2-Fluorobiphenyl (Surr)	99		40 - 140

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 680-752490/65
Matrix: Water
Analysis Batch: 752490

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB	MB	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Chloride	0.50	U	0.50	0.50	0.20	mg/L		11/24/22 01:17	1
Sulfate	1.0	U	1.0	1.0	0.40	mg/L		11/24/22 01:17	1

Lab Sample ID: LCS 680-752490/69
Matrix: Water
Analysis Batch: 752490

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike	LCS	LCS	Unit	D	%Rec	%Rec
							Added
Chloride	10.0	10.0		mg/L		100	87 - 111
Sulfate	10.0	9.70		mg/L		97	87 - 112

Lab Sample ID: LCSD 680-752490/70
Matrix: Water
Analysis Batch: 752490

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike	LCSD	LCSD	Unit	D	%Rec	%Rec	RPD	Limit
							Added		
Chloride	10.0	10.0		mg/L		100	87 - 111	0	15
Sulfate	10.0	9.80		mg/L		98	87 - 112	1	15

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: 680-224346-2 MS
Matrix: Water
Analysis Batch: 752490

Client Sample ID: LFM-99-02B-FAL22
Prep Type: Total/NA

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec	Limits
	Result	Qualifier		Result	Qualifier					
Chloride	150	D	50.0	199	D	mg/L		96		87 - 111
Sulfate	17	D	50.0	69.0	D	mg/L		105		87 - 112

Lab Sample ID: 680-224346-2 MSD
Matrix: Water
Analysis Batch: 752490

Client Sample ID: LFM-99-02B-FAL22
Prep Type: Total/NA

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec	Limits	RPD	RPD	Limit
	Result	Qualifier		Result	Qualifier								
Chloride	150	D	50.0	198	D	mg/L		95		87 - 111	0		15
Sulfate	17	D	50.0	66.2	D	mg/L		99		87 - 112	4		15

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-748299/1-A
Matrix: Water
Analysis Batch: 748799

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 748299

Analyte	MB	MB	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Barium	10	U	20	10	4.4	ug/L		11/03/22 18:53	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		11/03/22 18:53	1
Chromium	4.0	U	10	4.0	1.1	ug/L		11/03/22 18:53	1
Copper	10	U	20	10	3.2	ug/L		11/03/22 18:53	1
Iron	50	U	100	50	20	ug/L		11/03/22 18:53	1
Lead	20	U	40	20	6.6	ug/L		11/03/22 18:53	1
Manganese	5.0	U	10	5.0	1.3	ug/L		11/03/22 18:53	1
Selenium	20	U	25	20	10	ug/L		11/03/22 18:53	1
Silver	5.0	U	10	5.0	1.5	ug/L		11/03/22 18:53	1

Lab Sample ID: LCS 680-748299/2-A
Matrix: Water
Analysis Batch: 748799

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 748299

Analyte	Spike	LCS	LCS	Unit	D	%Rec	%Rec	Limits
Barium	100	96.3		ug/L		96		88 - 113
Cadmium	50.0	46.3		ug/L		93		88 - 113
Chromium	100	96.5		ug/L		96		90 - 113
Copper	100	103		ug/L		103		86 - 114
Iron	5000	4810		ug/L		96		87 - 115
Lead	505	467		ug/L		93		86 - 113
Manganese	400	387		ug/L		97		90 - 114
Selenium	100	92.5		ug/L		92		83 - 114
Silver	50.0	46.8		ug/L		94		84 - 115

Lab Sample ID: 680-224346-2 MS
Matrix: Water
Analysis Batch: 748799

Client Sample ID: LFM-99-02B-FAL22
Prep Type: Total Recoverable
Prep Batch: 748299

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec	Limits
	Result	Qualifier		Result	Qualifier					
Barium	6.6	J	100	98.6		ug/L		92		88 - 113
Cadmium	1.0	U	50.0	45.0		ug/L		90		88 - 113

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: 680-224346-2 MS
Matrix: Water
Analysis Batch: 748799

Client Sample ID: LFM-99-02B-FAL22
Prep Type: Total Recoverable
Prep Batch: 748299

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chromium	4.0	U	100	93.3		ug/L		93	90 - 113
Copper	10	U	100	100		ug/L		100	86 - 114
Iron	50	U	5000	4550		ug/L		91	87 - 115
Lead	20	U	505	456		ug/L		90	86 - 113
Manganese	2.3	J	400	371		ug/L		92	90 - 114
Selenium	20	U	100	95.5		ug/L		95	83 - 114
Silver	5.0	U	50.0	46.5		ug/L		93	84 - 115

Lab Sample ID: 680-224346-2 MSD
Matrix: Water
Analysis Batch: 748799

Client Sample ID: LFM-99-02B-FAL22
Prep Type: Total Recoverable
Prep Batch: 748299

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Barium	6.6	J	100	105		ug/L		99	88 - 113	6	20
Cadmium	1.0	U	50.0	47.4		ug/L		95	88 - 113	5	20
Chromium	4.0	U	100	99.1		ug/L		99	90 - 113	6	20
Copper	10	U	100	107		ug/L		107	86 - 114	6	20
Iron	50	U	5000	4820		ug/L		96	87 - 115	6	20
Lead	20	U	505	482		ug/L		96	86 - 113	6	20
Manganese	2.3	J	400	393		ug/L		98	90 - 114	6	20
Selenium	20	U	100	95.4		ug/L		95	83 - 114	0	20
Silver	5.0	U	50.0	49.3		ug/L		99	84 - 115	6	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 680-748301/1-A
Matrix: Water
Analysis Batch: 748817

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 748301

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		11/03/22 17:09	1

Lab Sample ID: LCS 680-748301/2-A
Matrix: Water
Analysis Batch: 748817

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 748301

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	102		ug/L		102	84 - 116

Lab Sample ID: 680-224346-2 MS
Matrix: Water
Analysis Batch: 748817

Client Sample ID: LFM-99-02B-FAL22
Prep Type: Total Recoverable
Prep Batch: 748301

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	3.0	U	100	102		ug/L		102	84 - 116

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 680-224346-2 MSD
 Matrix: Water
 Analysis Batch: 748817

Client Sample ID: LFM-99-02B-FAL22
 Prep Type: Total Recoverable
 Prep Batch: 748301

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	3.0	U	100	101		ug/L		101	84 - 116	1	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 680-748689/1-A
 Matrix: Water
 Analysis Batch: 748936

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 748689

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		11/04/22 14:45	1

Lab Sample ID: LCS 680-748689/2-A
 Matrix: Water
 Analysis Batch: 748936

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 748689

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.50	2.43		ug/L		97	80 - 124

Lab Sample ID: 680-224346-2 MS
 Matrix: Water
 Analysis Batch: 748936

Client Sample ID: LFM-99-02B-FAL22
 Prep Type: Total/NA
 Prep Batch: 748689

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.20	U	1.00	0.939		ug/L		94	80 - 124

Lab Sample ID: 680-224346-2 MSD
 Matrix: Water
 Analysis Batch: 748936

Client Sample ID: LFM-99-02B-FAL22
 Prep Type: Total/NA
 Prep Batch: 748689

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	0.20	U	1.00	0.931		ug/L		93	80 - 124	1	20

Method: 2320B-2011 - Alkalinity, Total

Lab Sample ID: MB 680-749724/37
 Matrix: Water
 Analysis Batch: 749724

Client Sample ID: Method Blank
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity	5.0	U	5.0	5.0	2.2	mg/L		11/09/22 17:36	1

Lab Sample ID: MB 680-749724/4
 Matrix: Water
 Analysis Batch: 749724

Client Sample ID: Method Blank
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity	5.0	U	5.0	5.0	2.2	mg/L		11/09/22 12:10	1

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Method: 2320B-2011 - Alkalinity, Total (Continued)

Lab Sample ID: LCS 680-749724/39
 Matrix: Water
 Analysis Batch: 749724

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Alkalinity	250	242		mg/L		97	90 - 112

Lab Sample ID: LCS 680-749724/6
 Matrix: Water
 Analysis Batch: 749724

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Alkalinity	250	241		mg/L		97	90 - 112

Lab Sample ID: LCSD 680-749724/31
 Matrix: Water
 Analysis Batch: 749724

Client Sample ID: Lab Control Sample Dup
 Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Alkalinity	250	247		mg/L		99	90 - 112	2	30

Lab Sample ID: LCSD 680-749724/64
 Matrix: Water
 Analysis Batch: 749724

Client Sample ID: Lab Control Sample Dup
 Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Alkalinity	250	32.9	Q	mg/L		13	90 - 112	152	30

Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 280-593201/22
 Matrix: Water
 Analysis Batch: 593201

Client Sample ID: Method Blank
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Nitrate/Nitrite-N	0.0562	J	0.10	0.080	0.044	mg/L		11/11/22 11:12	1

Lab Sample ID: LCS 280-593201/21
 Matrix: Water
 Analysis Batch: 593201

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate/Nitrite-N	5.00	5.09		mg/L		102	90 - 110

Method: 353.2-1993 R2.0 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 680-749672/14
 Matrix: Water
 Analysis Batch: 749672

Client Sample ID: Method Blank
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Nitrate Nitrite as N	0.025	U	0.050	0.025	0.010	mg/L		11/08/22 16:07	1

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Method: 353.2-1993 R2.0 - Nitrogen, Nitrate-Nitrite (Continued)

Lab Sample ID: LCS 680-749672/17
Matrix: Water
Analysis Batch: 749672

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate Nitrite as N	1.00	0.987		mg/L		99	90 - 110

Lab Sample ID: 680-224346-2 MS
Matrix: Water
Analysis Batch: 749672

Client Sample ID: LFM-99-02B-FAL22
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate Nitrite as N	0.53		1.00	1.55		mg/L		102	90 - 110

Lab Sample ID: 680-224346-2 MSD
Matrix: Water
Analysis Batch: 749672

Client Sample ID: LFM-99-02B-FAL22
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Nitrate Nitrite as N	0.53		1.00	1.57		mg/L		104	90 - 110	1	10

Method: 410.4 - COD

Lab Sample ID: MB 280-592249/5
Matrix: Water
Analysis Batch: 592249

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chemical Oxygen Demand	20	U	20	20	8.7	mg/L		11/03/22 11:43	1

Lab Sample ID: LCS 280-592249/3
Matrix: Water
Analysis Batch: 592249

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chemical Oxygen Demand	100	99.8		mg/L		100	90 - 110

Lab Sample ID: LCSD 280-592249/4
Matrix: Water
Analysis Batch: 592249

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chemical Oxygen Demand	100	101		mg/L		101	90 - 110	2	11

Lab Sample ID: 680-224346-2 MS
Matrix: Water
Analysis Batch: 592249

Client Sample ID: LFM-99-02B-FAL22
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chemical Oxygen Demand	14	J1	50.0	63.7		mg/L		99	90 - 110

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Method: 410.4 - COD (Continued)

Lab Sample ID: 680-224346-2 MSD
Matrix: Water
Analysis Batch: 592249

Client Sample ID: LFM-99-02B-FAL22
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chemical Oxygen Demand	14	J1	50.0	60.2		mg/L		92	90 - 110	6	11

Method: 9012B - Cyanide, Total and/or Amenable

Lab Sample ID: MB 680-749684/12-A
Matrix: Water
Analysis Batch: 749845

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 749684

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Cyanide, Total	0.0050	U	0.010	0.0050	0.0025	mg/L		11/09/22 15:58	1

Lab Sample ID: LCS 680-749684/13-A
Matrix: Water
Analysis Batch: 749845

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 749684

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	0.0500	0.0518		mg/L		104	83 - 116

Lab Sample ID: 680-224346-2 MS
Matrix: Water
Analysis Batch: 749845

Client Sample ID: LFM-99-02B-FAL22
Prep Type: Total/NA
Prep Batch: 749684

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	0.0064	J1	0.0500	0.0478		mg/L		83	83 - 116

Lab Sample ID: 680-224346-2 MSD
Matrix: Water
Analysis Batch: 749845

Client Sample ID: LFM-99-02B-FAL22
Prep Type: Total/NA
Prep Batch: 749684

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Cyanide, Total	0.0064	J1	0.0500	0.0636	J1	mg/L		114	83 - 116	28	20

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 280-592260/1
Matrix: Water
Analysis Batch: 592260

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	9.9	U	10	9.9	4.7	mg/L		11/03/22 12:16	1

Lab Sample ID: LCS 280-592260/2
Matrix: Water
Analysis Batch: 592260

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids (TDS)	501	473		mg/L		94	88 - 114

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QC Association Summary

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

GC VOA

Analysis Batch: 17188

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224346-1	DCL-DUP01-FAL22	Total/NA	Water	MAVPH2.1	
680-224346-2	LFM-99-02B-FAL22	Total/NA	Water	MAVPH2.1	
680-224346-3	LFM-99-05A-FAL22	Total/NA	Water	MAVPH2.1	
680-224346-4	LFM-99-06A-RP-FAL22	Total/NA	Water	MAVPH2.1	
MB 620-17188/6	Method Blank	Total/NA	Water	MAVPH2.1	
LCS 620-17188/3	Lab Control Sample	Total/NA	Water	MAVPH2.1	
LCSD 620-17188/4	Lab Control Sample Dup	Total/NA	Water	MAVPH2.1	

Analysis Batch: 17232

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 620-17232/6	Method Blank	Total/NA	Water	MAVPH2.1	
LCS 620-17232/3	Lab Control Sample	Total/NA	Water	MAVPH2.1	
LCSD 620-17232/4	Lab Control Sample Dup	Total/NA	Water	MAVPH2.1	
680-224346-2 MS	LFM-99-02B-FAL22	Total/NA	Water	MAVPH2.1	
680-224346-2 MSD	LFM-99-02B-FAL22	Total/NA	Water	MAVPH2.1	

GC Semi VOA

Analysis Batch: 17042

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 620-17055/1-B	Method Blank	Total/NA	Water	MAEPH2.1	17072
LCS 620-17055/2-B	Lab Control Sample	Total/NA	Water	MAEPH2.1	17072
LCSD 620-17055/3-B	Lab Control Sample Dup	Total/NA	Water	MAEPH2.1	17072

Prep Batch: 17055

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224346-1	DCL-DUP01-FAL22	Total/NA	Water	3510C	
680-224346-2	LFM-99-02B-FAL22	Total/NA	Water	3510C	
680-224346-3	LFM-99-05A-FAL22	Total/NA	Water	3510C	
680-224346-4	LFM-99-06A-RP-FAL22	Total/NA	Water	3510C	
MB 620-17055/1-B	Method Blank	Total/NA	Water	3510C	
LCS 620-17055/2-B	Lab Control Sample	Total/NA	Water	3510C	
LCSD 620-17055/3-B	Lab Control Sample Dup	Total/NA	Water	3510C	
680-224346-2 MS	LFM-99-02B-FAL22	Total/NA	Water	3510C	
680-224346-2 MSD	LFM-99-02B-FAL22	Total/NA	Water	3510C	

Fraction Batch: 17072

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224346-1	DCL-DUP01-FAL22	Total/NA	Water	MA EPH Frac	17055
680-224346-2	LFM-99-02B-FAL22	Total/NA	Water	MA EPH Frac	17055
680-224346-3	LFM-99-05A-FAL22	Total/NA	Water	MA EPH Frac	17055
680-224346-4	LFM-99-06A-RP-FAL22	Total/NA	Water	MA EPH Frac	17055
MB 620-17055/1-B	Method Blank	Total/NA	Water	MA EPH Frac	17055
LCS 620-17055/2-B	Lab Control Sample	Total/NA	Water	MA EPH Frac	17055
LCSD 620-17055/3-B	Lab Control Sample Dup	Total/NA	Water	MA EPH Frac	17055
680-224346-2 MS	LFM-99-02B-FAL22	Total/NA	Water	MA EPH Frac	17055
680-224346-2 MSD	LFM-99-02B-FAL22	Total/NA	Water	MA EPH Frac	17055

Analysis Batch: 17166

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224346-1	DCL-DUP01-FAL22	Total/NA	Water	MAEPH2.1	17072

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QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

GC Semi VOA (Continued)

Analysis Batch: 17166 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224346-2	LFM-99-02B-FAL22	Total/NA	Water	MAEPH2.1	17072
680-224346-3	LFM-99-05A-FAL22	Total/NA	Water	MAEPH2.1	17072
680-224346-4	LFM-99-06A-RP-FAL22	Total/NA	Water	MAEPH2.1	17072
680-224346-2 MS	LFM-99-02B-FAL22	Total/NA	Water	MAEPH2.1	17072
680-224346-2 MSD	LFM-99-02B-FAL22	Total/NA	Water	MAEPH2.1	17072

Prep Batch: 748736

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224346-1	DCL-DUP01-FAL22	Total/NA	Water	3510C	
680-224346-2	LFM-99-02B-FAL22	Total/NA	Water	3510C	
680-224346-3	LFM-99-05A-FAL22	Total/NA	Water	3510C	
680-224346-4	LFM-99-06A-RP-FAL22	Total/NA	Water	3510C	
MB 680-748736/1-A	Method Blank	Total/NA	Water	3510C	
LCS 680-748736/2-A	Lab Control Sample	Total/NA	Water	3510C	
680-224346-2 MS	LFM-99-02B-FAL22	Total/NA	Water	3510C	
680-224346-2 MSD	LFM-99-02B-FAL22	Total/NA	Water	3510C	

Analysis Batch: 749075

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224346-1	DCL-DUP01-FAL22	Total/NA	Water	8081B 8082A	748736
680-224346-2	LFM-99-02B-FAL22	Total/NA	Water	8081B 8082A	748736
680-224346-3	LFM-99-05A-FAL22	Total/NA	Water	8081B 8082A	748736
680-224346-4	LFM-99-06A-RP-FAL22	Total/NA	Water	8081B 8082A	748736
MB 680-748736/1-A	Method Blank	Total/NA	Water	8081B 8082A	748736
LCS 680-748736/2-A	Lab Control Sample	Total/NA	Water	8081B 8082A	748736
680-224346-2 MS	LFM-99-02B-FAL22	Total/NA	Water	8081B 8082A	748736
680-224346-2 MSD	LFM-99-02B-FAL22	Total/NA	Water	8081B 8082A	748736

HPLC/IC

Analysis Batch: 752490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224346-1	DCL-DUP01-FAL22	Total/NA	Water	9056A	
680-224346-2	LFM-99-02B-FAL22	Total/NA	Water	9056A	
680-224346-3	LFM-99-05A-FAL22	Total/NA	Water	9056A	
680-224346-4	LFM-99-06A-RP-FAL22	Total/NA	Water	9056A	
MB 680-752490/65	Method Blank	Total/NA	Water	9056A	
LCS 680-752490/69	Lab Control Sample	Total/NA	Water	9056A	
LCSD 680-752490/70	Lab Control Sample Dup	Total/NA	Water	9056A	
680-224346-2 MS	LFM-99-02B-FAL22	Total/NA	Water	9056A	
680-224346-2 MSD	LFM-99-02B-FAL22	Total/NA	Water	9056A	

Metals

Prep Batch: 748299

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224346-1	DCL-DUP01-FAL22	Total Recoverable	Water	3005A	
680-224346-2	LFM-99-02B-FAL22	Total Recoverable	Water	3005A	
680-224346-3	LFM-99-05A-FAL22	Total Recoverable	Water	3005A	
680-224346-4	LFM-99-06A-RP-FAL22	Total Recoverable	Water	3005A	
MB 680-748299/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-748299/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

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QC Association Summary

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Metals (Continued)

Prep Batch: 748299 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224346-2 MS	LFM-99-02B-FAL22	Total Recoverable	Water	3005A	
680-224346-2 MSD	LFM-99-02B-FAL22	Total Recoverable	Water	3005A	

Prep Batch: 748301

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224346-1	DCL-DUP01-FAL22	Total Recoverable	Water	3005A	
680-224346-2	LFM-99-02B-FAL22	Total Recoverable	Water	3005A	
680-224346-3	LFM-99-05A-FAL22	Total Recoverable	Water	3005A	
680-224346-4	LFM-99-06A-RP-FAL22	Total Recoverable	Water	3005A	
MB 680-748301/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-748301/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-224346-2 MS	LFM-99-02B-FAL22	Total Recoverable	Water	3005A	
680-224346-2 MSD	LFM-99-02B-FAL22	Total Recoverable	Water	3005A	

Prep Batch: 748689

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224346-1	DCL-DUP01-FAL22	Total/NA	Water	7470A	
680-224346-2	LFM-99-02B-FAL22	Total/NA	Water	7470A	
680-224346-3	LFM-99-05A-FAL22	Total/NA	Water	7470A	
680-224346-4	LFM-99-06A-RP-FAL22	Total/NA	Water	7470A	
MB 680-748689/1-A	Method Blank	Total/NA	Water	7470A	
LCS 680-748689/2-A	Lab Control Sample	Total/NA	Water	7470A	
680-224346-2 MS	LFM-99-02B-FAL22	Total/NA	Water	7470A	
680-224346-2 MSD	LFM-99-02B-FAL22	Total/NA	Water	7470A	

Analysis Batch: 748799

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224346-1	DCL-DUP01-FAL22	Total Recoverable	Water	6010C	748299
680-224346-2	LFM-99-02B-FAL22	Total Recoverable	Water	6010C	748299
680-224346-3	LFM-99-05A-FAL22	Total Recoverable	Water	6010C	748299
680-224346-4	LFM-99-06A-RP-FAL22	Total Recoverable	Water	6010C	748299
MB 680-748299/1-A	Method Blank	Total Recoverable	Water	6010C	748299
LCS 680-748299/2-A	Lab Control Sample	Total Recoverable	Water	6010C	748299
680-224346-2 MS	LFM-99-02B-FAL22	Total Recoverable	Water	6010C	748299
680-224346-2 MSD	LFM-99-02B-FAL22	Total Recoverable	Water	6010C	748299

Analysis Batch: 748817

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224346-1	DCL-DUP01-FAL22	Total Recoverable	Water	6020A	748301
680-224346-2	LFM-99-02B-FAL22	Total Recoverable	Water	6020A	748301
680-224346-3	LFM-99-05A-FAL22	Total Recoverable	Water	6020A	748301
680-224346-4	LFM-99-06A-RP-FAL22	Total Recoverable	Water	6020A	748301
MB 680-748301/1-A	Method Blank	Total Recoverable	Water	6020A	748301
LCS 680-748301/2-A	Lab Control Sample	Total Recoverable	Water	6020A	748301
680-224346-2 MS	LFM-99-02B-FAL22	Total Recoverable	Water	6020A	748301
680-224346-2 MSD	LFM-99-02B-FAL22	Total Recoverable	Water	6020A	748301

Analysis Batch: 748936

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224346-1	DCL-DUP01-FAL22	Total/NA	Water	7470A	748689
680-224346-2	LFM-99-02B-FAL22	Total/NA	Water	7470A	748689

Eurofins Savannah

QC Association Summary

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Metals (Continued)

Analysis Batch: 748936 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224346-3	LFM-99-05A-FAL22	Total/NA	Water	7470A	748689
680-224346-4	LFM-99-06A-RP-FAL22	Total/NA	Water	7470A	748689
MB 680-748689/1-A	Method Blank	Total/NA	Water	7470A	748689
LCS 680-748689/2-A	Lab Control Sample	Total/NA	Water	7470A	748689
680-224346-2 MS	LFM-99-02B-FAL22	Total/NA	Water	7470A	748689
680-224346-2 MSD	LFM-99-02B-FAL22	Total/NA	Water	7470A	748689

General Chemistry

Analysis Batch: 592249

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224346-1	DCL-DUP01-FAL22	Total/NA	Water	410.4	
680-224346-2	LFM-99-02B-FAL22	Total/NA	Water	410.4	
680-224346-3	LFM-99-05A-FAL22	Total/NA	Water	410.4	
680-224346-4	LFM-99-06A-RP-FAL22	Total/NA	Water	410.4	
MB 280-592249/5	Method Blank	Total/NA	Water	410.4	
LCS 280-592249/3	Lab Control Sample	Total/NA	Water	410.4	
LCSD 280-592249/4	Lab Control Sample Dup	Total/NA	Water	410.4	
680-224346-2 MS	LFM-99-02B-FAL22	Total/NA	Water	410.4	
680-224346-2 MSD	LFM-99-02B-FAL22	Total/NA	Water	410.4	

Analysis Batch: 592260

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224346-1	DCL-DUP01-FAL22	Total/NA	Water	SM 2540C	
680-224346-2	LFM-99-02B-FAL22	Total/NA	Water	SM 2540C	
680-224346-3	LFM-99-05A-FAL22	Total/NA	Water	SM 2540C	
680-224346-4	LFM-99-06A-RP-FAL22	Total/NA	Water	SM 2540C	
MB 280-592260/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-592260/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 593201

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224346-1	DCL-DUP01-FAL22	Total/NA	Water	353.2	
MB 280-593201/22	Method Blank	Total/NA	Water	353.2	
LCS 280-593201/21	Lab Control Sample	Total/NA	Water	353.2	

Analysis Batch: 749672

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224346-2	LFM-99-02B-FAL22	Total/NA	Water	353.2-1993 R2.0	
680-224346-3	LFM-99-05A-FAL22	Total/NA	Water	353.2-1993 R2.0	
680-224346-4	LFM-99-06A-RP-FAL22	Total/NA	Water	353.2-1993 R2.0	
MB 680-749672/14	Method Blank	Total/NA	Water	353.2-1993 R2.0	
LCS 680-749672/17	Lab Control Sample	Total/NA	Water	353.2-1993 R2.0	
680-224346-2 MS	LFM-99-02B-FAL22	Total/NA	Water	353.2-1993 R2.0	
680-224346-2 MSD	LFM-99-02B-FAL22	Total/NA	Water	353.2-1993 R2.0	

Prep Batch: 749684

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224346-1	DCL-DUP01-FAL22	Total/NA	Water	9012B	
680-224346-2	LFM-99-02B-FAL22	Total/NA	Water	9012B	
680-224346-3	LFM-99-05A-FAL22	Total/NA	Water	9012B	

Eurofins Savannah

QC Association Summary

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

General Chemistry (Continued)

Prep Batch: 749684 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224346-4	LFM-99-06A-RP-FAL22	Total/NA	Water	9012B	
MB 680-749684/12-A	Method Blank	Total/NA	Water	9012B	
LCS 680-749684/13-A	Lab Control Sample	Total/NA	Water	9012B	
680-224346-2 MS	LFM-99-02B-FAL22	Total/NA	Water	9012B	
680-224346-2 MSD	LFM-99-02B-FAL22	Total/NA	Water	9012B	

Analysis Batch: 749724

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224346-1	DCL-DUP01-FAL22	Total/NA	Water	2320B-2011	
680-224346-2	LFM-99-02B-FAL22	Total/NA	Water	2320B-2011	
680-224346-3	LFM-99-05A-FAL22	Total/NA	Water	2320B-2011	
680-224346-4	LFM-99-06A-RP-FAL22	Total/NA	Water	2320B-2011	
MB 680-749724/37	Method Blank	Total/NA	Water	2320B-2011	
MB 680-749724/4	Method Blank	Total/NA	Water	2320B-2011	
LCS 680-749724/39	Lab Control Sample	Total/NA	Water	2320B-2011	
LCS 680-749724/6	Lab Control Sample	Total/NA	Water	2320B-2011	
LCSD 680-749724/31	Lab Control Sample Dup	Total/NA	Water	2320B-2011	
LCSD 680-749724/64	Lab Control Sample Dup	Total/NA	Water	2320B-2011	

Analysis Batch: 749845

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224346-1	DCL-DUP01-FAL22	Total/NA	Water	9012B	749684
680-224346-2	LFM-99-02B-FAL22	Total/NA	Water	9012B	749684
680-224346-3	LFM-99-05A-FAL22	Total/NA	Water	9012B	749684
680-224346-4	LFM-99-06A-RP-FAL22	Total/NA	Water	9012B	749684
MB 680-749684/12-A	Method Blank	Total/NA	Water	9012B	749684
LCS 680-749684/13-A	Lab Control Sample	Total/NA	Water	9012B	749684
680-224346-2 MS	LFM-99-02B-FAL22	Total/NA	Water	9012B	749684
680-224346-2 MSD	LFM-99-02B-FAL22	Total/NA	Water	9012B	749684

Lab Chronicle

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Client Sample ID: DCL-DUP01-FAL22

Lab Sample ID: 680-224346-1

Date Collected: 10/27/22 11:15

Matrix: Water

Date Received: 10/29/22 09:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	MAVPH2.1		1	1 mL	1 mL	17188	11/08/22 15:18	BMH	EET NE
Instrument ID: FID1										
Total/NA	Prep	3510C			239.1 mL	1 mL	748736	11/03/22 17:37	MR	EET SAV
Total/NA	Analysis	8081B 8082A		1	1 mL	1 mL	749075	11/05/22 19:39	JCK	EET SAV
Instrument ID: CSGZ										
Total/NA	Prep	3510C			1050 mL	1 mL	17055	11/04/22 09:59	PRB	EET NE
Total/NA	Fraction	MA EPH Frac			1 mL	1 mL	17072	11/04/22 14:14	PRB	EET NE
Total/NA	Analysis	MAEPH2.1		1			17166	11/08/22 17:08	JS	EET NE
Instrument ID: HPS18										
Total/NA	Analysis	9056A		5	5 mL	5 mL	752490	11/24/22 06:37	AF	EET SAV
Instrument ID: CICH										
Total Recoverable	Prep	3005A			50 mL	50 mL	748299	11/02/22 08:35	RR	EET SAV
Total Recoverable	Analysis	6010C		1			748799	11/03/22 19:14	BJB	EET SAV
Instrument ID: ICPH										
Total Recoverable	Prep	3005A			50 mL	250 mL	748301	11/02/22 08:35	RR	EET SAV
Total Recoverable	Analysis	6020A		1			748817	11/03/22 17:29	BWR	EET SAV
Instrument ID: ICPMSD										
Total/NA	Prep	7470A			50 mL	50 mL	748689	11/03/22 16:11	JKL	EET SAV
Total/NA	Analysis	7470A		1			748936	11/04/22 14:55	JKL	EET SAV
Instrument ID: QuickTrace2										
Total/NA	Analysis	2320B-2011		1			749724	11/09/22 18:24	DR	EET SAV
Instrument ID: MANTECH 2										
Total/NA	Analysis	353.2		1	100 mL	100 mL	593201	11/11/22 11:20	ZPM	EET DEN
Instrument ID: WC_Alp 2										
Total/NA	Analysis	410.4		1	2 mL	2 mL	592249	11/03/22 11:43	BCR	EET DEN
Instrument ID: WC_Genesys20										
Total/NA	Prep	9012B			6 mL	6 mL	749684	11/09/22 08:17	JAS	EET SAV
Total/NA	Analysis	9012B		1			749845	11/09/22 15:59	JAS	EET SAV
Instrument ID: KONELAB4										
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	592260	11/03/22 12:16	ASP	EET DEN
Instrument ID: NoEquip										

Client Sample ID: LFM-99-02B-FAL22

Lab Sample ID: 680-224346-2

Date Collected: 10/27/22 10:25

Matrix: Water

Date Received: 10/29/22 09:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	MAVPH2.1		1	1 mL	1 mL	17188	11/08/22 16:04	BMH	EET NE
Instrument ID: FID1										
Total/NA	Prep	3510C			268.6 mL	1 mL	748736	11/03/22 17:37	MR	EET SAV
Total/NA	Analysis	8081B 8082A		1	1 mL	1 mL	749075	11/05/22 19:24	JCK	EET SAV
Instrument ID: CSGZ										

Lab Chronicle

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Client Sample ID: LFM-99-02B-FAL22

Lab Sample ID: 680-224346-2

Date Collected: 10/27/22 10:25

Matrix: Water

Date Received: 10/29/22 09:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			1050 mL	1 mL	17055	11/04/22 09:59	PRB	EET NE
Total/NA	Fraction	MA EPH Frac			1 mL	1 mL	17072	11/04/22 14:14	PRB	EET NE
Total/NA	Analysis	MAEPH2.1		1			17166	11/08/22 17:38	JS	EET NE
Instrument ID: HPS18										
Total/NA	Analysis	9056A		5	5 mL	5 mL	752490	11/24/22 06:51	AF	EET SAV
Instrument ID: CICH										
Total Recoverable	Prep	3005A			50 mL	50 mL	748299	11/02/22 08:35	RR	EET SAV
Total Recoverable	Analysis	6010C		1			748799	11/03/22 18:59	BJB	EET SAV
Instrument ID: ICPH										
Total Recoverable	Prep	3005A			50 mL	250 mL	748301	11/02/22 08:35	RR	EET SAV
Total Recoverable	Analysis	6020A		1			748817	11/03/22 17:15	BWR	EET SAV
Instrument ID: ICPMSD										
Total/NA	Prep	7470A			50 mL	50 mL	748689	11/03/22 16:11	JKL	EET SAV
Total/NA	Analysis	7470A		1			748936	11/04/22 14:58	JKL	EET SAV
Instrument ID: QuickTrace2										
Total/NA	Analysis	2320B-2011		1			749724	11/09/22 13:02	DR	EET SAV
Instrument ID: MANTECH 2										
Total/NA	Analysis	353.2-1993 R2.0		1	2 mL	2 mL	749672	11/08/22 16:12	ALG	EET SAV
Instrument ID: LACHAT2										
Total/NA	Analysis	410.4		1	2 mL	2 mL	592249	11/03/22 11:43	BCR	EET DEN
Instrument ID: WC_Genesys20										
Total/NA	Prep	9012B			6 mL	6 mL	749684	11/09/22 08:17	JAS	EET SAV
Total/NA	Analysis	9012B		1			749845	11/09/22 15:58	JAS	EET SAV
Instrument ID: KONELAB4										
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	592260	11/03/22 12:16	ASP	EET DEN
Instrument ID: NoEquip										

Client Sample ID: LFM-99-05A-FAL22

Lab Sample ID: 680-224346-3

Date Collected: 10/27/22 11:15

Matrix: Water

Date Received: 10/29/22 09:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	MAVPH2.1		1	1 mL	1 mL	17188	11/08/22 16:42	BMH	EET NE
Instrument ID: FID1										
Total/NA	Prep	3510C			271.6 mL	1 mL	748736	11/03/22 17:37	MR	EET SAV
Total/NA	Analysis	8081B 8082A		1	1 mL	1 mL	749075	11/05/22 19:54	JCK	EET SAV
Instrument ID: CSGZ										
Total/NA	Prep	3510C			1050 mL	1 mL	17055	11/04/22 09:59	PRB	EET NE
Total/NA	Fraction	MA EPH Frac			1 mL	1 mL	17072	11/04/22 14:14	PRB	EET NE
Total/NA	Analysis	MAEPH2.1		1			17166	11/08/22 19:09	JS	EET NE
Instrument ID: HPS18										
Total/NA	Analysis	9056A		2	5 mL	5 mL	752490	11/24/22 07:30	AF	EET SAV
Instrument ID: CICH										

Eurofins Savannah

Lab Chronicle

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Client Sample ID: LFM-99-05A-FAL22

Lab Sample ID: 680-224346-3

Date Collected: 10/27/22 11:15

Matrix: Water

Date Received: 10/29/22 09:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	748299	11/02/22 08:35	RR	EET SAV
Total Recoverable	Analysis	6010C		1			748799	11/03/22 19:17	BJB	EET SAV
Instrument ID: ICPH										
Total Recoverable	Prep	3005A			50 mL	250 mL	748301	11/02/22 08:35	RR	EET SAV
Total Recoverable	Analysis	6020A		1			748817	11/03/22 17:31	BWR	EET SAV
Instrument ID: ICPMSD										
Total/NA	Prep	7470A			50 mL	50 mL	748689	11/03/22 16:11	JKL	EET SAV
Total/NA	Analysis	7470A		1			748936	11/04/22 15:05	JKL	EET SAV
Instrument ID: QuickTrace2										
Total/NA	Analysis	2320B-2011		1			749724	11/09/22 12:47	DR	EET SAV
Instrument ID: MANTECH 2										
Total/NA	Analysis	353.2-1993 R2.0		1	2 mL	2 mL	749672	11/08/22 16:18	ALG	EET SAV
Instrument ID: LACHAT2										
Total/NA	Analysis	410.4		1	2 mL	2 mL	592249	11/03/22 11:43	BCR	EET DEN
Instrument ID: WC_Genesys20										
Total/NA	Prep	9012B			6 mL	6 mL	749684	11/09/22 08:17	JAS	EET SAV
Total/NA	Analysis	9012B		1			749845	11/09/22 15:59	JAS	EET SAV
Instrument ID: KONELAB4										
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	592260	11/03/22 12:16	ASP	EET DEN
Instrument ID: NoEquip										

Client Sample ID: LFM-99-06A-RP-FAL22

Lab Sample ID: 680-224346-4

Date Collected: 10/27/22 10:10

Matrix: Water

Date Received: 10/29/22 09:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	MAVPH2.1		1	1 mL	1 mL	17188	11/08/22 17:20	BMH	EET NE
Instrument ID: FID1										
Total/NA	Prep	3510C			274.1 mL	1 mL	748736	11/03/22 17:37	MR	EET SAV
Total/NA	Analysis	8081B 8082A		1	1 mL	1 mL	749075	11/05/22 20:09	JCK	EET SAV
Instrument ID: CSGZ										
Total/NA	Prep	3510C			1050 mL	1 mL	17055	11/04/22 09:59	PRB	EET NE
Total/NA	Fraction	MA EPH Frac			1 mL	1 mL	17072	11/04/22 14:14	PRB	EET NE
Total/NA	Analysis	MAEPH2.1		1			17166	11/08/22 19:39	JS	EET NE
Instrument ID: HPS18										
Total/NA	Analysis	9056A		5	5 mL	5 mL	752490	11/24/22 07:44	AF	EET SAV
Instrument ID: CICH										
Total Recoverable	Prep	3005A			50 mL	50 mL	748299	11/02/22 08:35	RR	EET SAV
Total Recoverable	Analysis	6010C		1			748799	11/03/22 19:20	BJB	EET SAV
Instrument ID: ICPH										
Total Recoverable	Prep	3005A			50 mL	250 mL	748301	11/02/22 08:35	RR	EET SAV
Total Recoverable	Analysis	6020A		1			748817	11/03/22 17:34	BWR	EET SAV
Instrument ID: ICPMSD										

Eurofins Savannah

Lab Chronicle

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Client Sample ID: LFM-99-06A-RP-FAL22

Lab Sample ID: 680-224346-4

Date Collected: 10/27/22 10:10

Matrix: Water

Date Received: 10/29/22 09:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			50 mL	50 mL	748689	11/03/22 16:11	JKL	EET SAV
Total/NA	Analysis	7470A		1			748936	11/04/22 15:08	JKL	EET SAV
Instrument ID: QuickTrace2										
Total/NA	Analysis	2320B-2011		1			749724	11/09/22 14:56	DR	EET SAV
Instrument ID: MANTECH 2										
Total/NA	Analysis	353.2-1993 R2.0		1	2 mL	2 mL	749672	11/08/22 16:27	ALG	EET SAV
Instrument ID: LACHAT2										
Total/NA	Analysis	410.4		1	2 mL	2 mL	592249	11/03/22 11:43	BCR	EET DEN
Instrument ID: WC_Genesys20										
Total/NA	Prep	9012B			6 mL	6 mL	749684	11/09/22 08:17	JAS	EET SAV
Total/NA	Analysis	9012B		1			749845	11/09/22 15:59	JAS	EET SAV
Instrument ID: KONELAB4										
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	592260	11/03/22 12:16	ASP	EET DEN
Instrument ID: NoEquip										

Laboratory References:

EET DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100
 EET NE = Eurofins New England, 646 Camp Ave, North Kingstown, RI 02852, TEL (413)789-9018
 EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	09-22-24

Laboratory: Eurofins Denver

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	2907.01	11-30-22

Laboratory: Eurofins New England

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	<cert No.>	02-28-23
Connecticut	State	PH-0722	06-30-22 *
Maine	State	RI00100	04-17-23
Massachusetts	State	M-RI907	06-30-23
New Hampshire	NELAP	2240	08-03-23
New Jersey	NELAP	RI008	06-30-23
New York	NELAP	11393	04-01-23
Rhode Island	State	LAI00368	12-30-22
USDA	US Federal Programs	P330-20-00109	04-15-23

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL, Fall 2022

Job ID: 680-224346-1

Method	Method Description	Protocol	Laboratory
MAVPH2.1	Massachusetts - Volatile Petroleum Hydrocarbons (GC)	MA DEP	EET NE
8081B 8082A	Organochlorine Pesticides & PCBs (GC)	SW846	EET SAV
MAEPH2.1	Massachusetts - Extractable Petroleum Hydrocarbons (GC)	MA DEP	EET NE
9056A	Anions, Ion Chromatography	SW846	EET SAV
6010C	Metals (ICP)	SW846	EET SAV
6020A	Metals (ICP/MS)	SW846	EET SAV
7470A	Mercury (CVAA)	SW846	EET SAV
2320B-2011	Alkalinity, Total	SM	EET SAV
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	EET DEN
353.2-1993 R2.0	Nitrogen, Nitrate-Nitrite	MCAWW	EET SAV
410.4	COD	MCAWW	EET DEN
9012B	Cyanide, Total and/or Amenable	EPA	EET SAV
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET DEN
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET SAV
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	EET NE
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	EET SAV
5030C	Purge and Trap	SW846	EET NE
7470A	Preparation, Mercury	SW846	EET SAV
9012B	Cyanide, Total and/or Amenable, Distillation	SW846	EET SAV
MA EPH Frac	Massachusetts - Extractable Petroleum Hydrocarbon Fractionation	MA DEP	EET NE

Protocol References:

- EPA = US Environmental Protection Agency
- MA DEP = Massachusetts Department Of Environmental Protection
- MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
- SM = "Standard Methods For The Examination Of Water And Wastewater"
- SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

- EET DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100
- EET NE = Eurofins New England, 646 Camp Ave, North Kingstown, RI 02852, TEL (413)789-9018
- EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

CHAIN-OF-CUSTODY RECORD

Series-Arcadis JV
Nathan Mullens
689 Marina Drive, Suite B7, Charleston, SC 29492
(843) 478-0336, jennifer.singer@arcadis.com

COC # DCL_FAL2022

Boston

#215

Project Name: Former Fort Devens, Long Term Monitoring

Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA

Event: Series-Arcadis JV, Long Term Monitoring, DCL, Fall 2022

Project Number: 30130800

POC: Jerry Lanier, 912-250-0281, jerry.lanier@eurofinsus.com

Ship to: Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah, GA 31404

WBS Code:

Comments:
A2208 (A) = Alkalinity
E353.2 (A) = Nitrite Nitrate as N
MADEPVP (A) = EPA with PAHs
MADEPVP (A) = EPA with organics
SW6010C (D) = Se Cd Cr Cu Pb Mn Sn Ag
SW1470A (A) = Mercury
SW6015 (A) = Pesticides
SW9012B (A) = Cyanide
SW9056A (A) = Cl SO4

Code	Matrix	WG	Ground Water
1	Container/Preservative		
2	2x 1L amber glass bottles, Cool to <6degC		
3	2x 1 Liter, amber glass, 1" HCl to pH <= 2; Cool < 6degC		
4	3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC		
5	1x 125mL plastic, Cool < 6degC		
6	1x 125mL plastic, Cool < 6degC		
9	1x 250mL plastic, HNO3, pH < 2; Cool < 6degC		
21	1x 2-1 Liter amber glass, Cool < 6degC		
46	1x 250mL plastic, Cool < 6degC		
47	1x 500mL, amber glass, H2SO4; Cool < 6degC		
48	1x 250mL plastic, NaOH to pH > 12; Cool < 6degC		
49	1x 500mL plastic, Cool < 6degC		

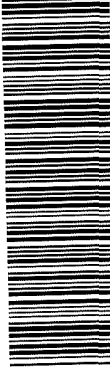
Equipment:

Analytical Test Method

Event: Series-Arcadis JV, Long Term Monitoring, DCL, Fall 2022

Sample ID	Matrix	Date	Time	Samp Init.	Location ID	Sample Type	Depth (ft bgs)		Cooler	Comments
							Top	Bottom		
1	DCL-DUP01-FAL22	10-27-22	1115	SG	LFM-99-05A	FD1	19.00	28.30	1	
2	LFM-03-07-FAL22				LFM-03-07	N1	10.90	20.90	1	
3	LFM-99-02B-FAL22	10-27-22	1025	GS	LFM-99-02B	N1	14.50	23.80	1	MS/MSD *
4	LFM-99-05A-FAL22	10-27-22	1115	SG	LFM-99-05A	N1	19.00	28.30	1	
5	LFM-99-06A-RP-FAL22	10-27-22	1010	DC	LFM-99-06A-RP	N1	17.50	32.50	1	
6										
7										
8										
9										
10										

Turnaround Time: Standard



680-224346 Chain of Custody

* MS Sampled at 1140
* MSD Sampled at 1255

Relinquished by: (Signature) *[Signature]*
Date 10/27/22
Time 17:10
Received by: (Signature) *[Signature]*

Received by Laboratory: (Signature) *[Signature]*
Date 10/27/22 17:00
Time

3.3/3.3 4.8/4.8 4.9/4.9 5.4/5.4
10-27-22 945
10-28-22 945



Chain of Custody Record

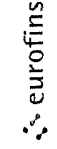


eurofins

Client Information (Sub Contract Lab)		Lab PM: Lanier, Jerry A	Carrier Tracking No(s): 680-714641.1
Client Contact: Shipping/Receiving		E-Mail: Jerry.Lanier@et.eurofins.com	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		State of Origin: Massachusetts	Job #: 680-224346-1
Address: 4955 Yarrow Street, Civ: Avada State, Zip: CO, 80002 Phone: 303-736-0100(Tel) 303-431-7171(Fax) Email:		Accreditations Required (See note): Dept. of Defense ELAP - A2LA; DoD - ANAB	Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:
Due Date Requested: 11/10/2022 TAT Requested (days): PO #: WO #: Project #: 68023801 SOW#:		Analysis Requested	
Sample Identification - Client ID (Lab ID)		Field Filled Sample (Yes or No)	Total Number of Containers
DCL-DJDP01-FAL22 (680-224346-1)	Sample Date 10/27/22	Field Filled Sample (Yes or No)	2
LFM-99-02B-FAL22 (680-224346-2)	Sample Date 10/27/22	Field Filled Sample (Yes or No)	2
LFM-99-02B-FAL22 (680-224346-2MS)	Sample Date 10/27/22	Field Filled Sample (Yes or No)	2
LFM-99-02B-FAL22 (680-224346-2MSD)	Sample Date 10/27/22	Field Filled Sample (Yes or No)	2
LFM-99-05A-FAL22 (680-224346-3)	Sample Date 10/27/22	Field Filled Sample (Yes or No)	2
LFM-99-06A-RP-FAL22 (680-224346-4)	Sample Date 10/27/22	Field Filled Sample (Yes or No)	2
Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing Southeast, LLC places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Southeast, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Southeast, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Southeast, LLC.		Special Instructions/Note:	
Possible Hazard Identification		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)	
Unconfirmed		Return To Client <input type="checkbox"/> Archive For <input type="checkbox"/> Months	
Deliverable Requested: I, II, III, IV, Other (specify)		Special Instructions/QC Requirements:	
Empty Kit Relinquished by:		Method of Shipment:	
Relinquished by: <i>[Signature]</i>		Date/Time: 11/10/22 11:30	
Relinquished by:		Date/Time: 11/2/23 0940	
Relinquished by:		Date/Time:	
Custody Seals Intact: Δ Yes Δ No		Company: ETA-Dew	
Custody Seal No.: 1886866		Company:	
Other Remarks: CR# 12 Temp. 0.3 CF(6.0)		Company:	



Chain of Custody Record



Client Information (Sub Contract Lab)
 Client Contact: Lanier, Jerry A
 Shipping/Receiving: Jerry Lanier@et.eurofins.com
 Company: Eurofins Environment Testing Northeast
 Address: 646 Camp Ave
 City: North Kingstown
 State Zip: RI 02852
 Phone: 413-789-9018 (Tel)
 Email:
 Project Name: Seres-Arcadis JV LTM DCL, Fall 2022
 Site:

Sampler Lab PM: Lanier, Jerry A
 Phone: Jerry Lanier@et.eurofins.com
 State of Origin: Massachusetts
 Carrier Tracking No(s): 680-714701 1
 Page: Page 1 of 1
 Job #: 680-224346-1
 Preservation Codes:
 A HCL
 B NaOH
 C - Zn Acetate
 D - Nitric Acid
 E NaHSO4
 F MeOH
 G - Amchlor
 H - Ascorbic Acid
 I Ice
 J DI Water
 K - EDTA
 L - EDA
 Other

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (Water, Seawater, On-water, etc.)	Field Filtered Sample (Yes or No)	Form MS/MSD (Yes or No)	MAEPH2 1/3510C_14d Massachusetts Extracable	MAYPH2/15030C VPH	Total Number of Containers	Special Instructions/Note.
DCL-DUP01-FAL22 (680-224346-1)	10/27/22	11 15 Eastern	Water	Water	X	X	X	X	3	
LFM-99-02B-FAL22 (680-224346-2)	10/27/22	10 25 Eastern	Water	Water	X	X	X	X	3	
LFM-99-02B-FAL22 (680-224346-2MS)	10/27/22	11 40 Eastern	MS	Water	X	X	X	X	3	
LFM-99-02B-FAL22 (680-224346-2MSD)	10/27/22	12 55 Eastern	MSD	Water	X	X	X	X	3	
LFM-99-05A-FAL22 (680-224346-3)	10/27/22	11 15 Eastern	Water	Water	X	X	X	X	3	
LFM-99-06A-RP-FAL22 (680-224346-4)	10/27/22	10 10 Eastern	Water	Water	X	X	X	X	3	

Note: Since laboratory accreditations are subject to change Eurofins Environment Testing Southeast, LLC places the ownership of method analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Southeast, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Southeast, LLC attention immediately. If all requested accreditations are current to date return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Southeast, LLC.

Possible Hazard Identification
 Unconfirmed
 Deliverable Requested I, II, III, IV Other (specify) Primary Deliverable Rank. 2
 Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client Disposal By Lab Archive For _____ Months
 Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment:
Relinquished by: <i>Sauben</i>	11-1-22 @ 1400		Company: BETA-SAV
Relinquished by: <i>FEDEx</i>	11/1/22 @ 10:20		Company: BETA
Relinquished by: <i>FEDEx</i>	11/2/22 @ 10:20		Company: BETA

Custody Seals Intact: Yes No
 Custody Seal No: 3.6 / 0.1 / 3.7 #16
 Cooler Temperature(s) °C and Other Remarks.



Environment Testing
TestAmerica

Part # 159469-434LMTW EXP 01/23

ORIGIN ID:SAVA (912) 354-7858
SHIPPING
EUROFINS SAVANNAH
5102 LAROCHE AVE

SHIP DATE: 01NOV22
ACTWGT: 15.00 LB MAN
CAD: 01483897CAFE3616

SAVANNAH, GA 31404
UNITED STATES US

BILL SENDER

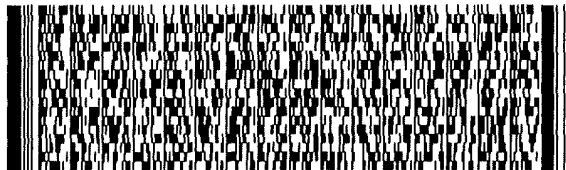
TO **S680 - 140317**
EUROFINS
646 CAMP AVENUE

NORTH KINGSTOWN RI 02852

INV:
PO:

REF:

DEPT:



FedEx
Express



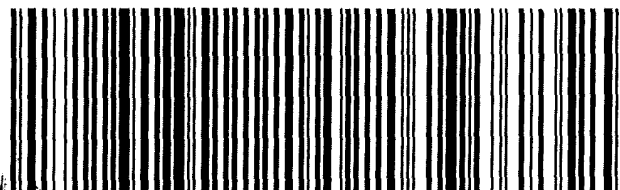
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TRK# 1864 9070 6472
0201

WED - 02 NOV 10:30A
PRIORITY OVERNIGHT

XE NCOA

02852
RI-US PVD



Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-224346-1

Login Number: 224346

List Source: Eurofins Savannah

List Number: 1

Creator: Sims, Robert D

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-224346-1

Login Number: 224346

List Number: 3

Creator: Rystrom, Joshua R

List Source: Eurofins Denver

List Creation: 11/02/22 07:22 PM

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-224346-1

Login Number: 224346

List Number: 2

Creator: Scott, Krishnan F

List Source: Eurofins New England

List Creation: 11/02/22 09:01 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	





ANALYTICAL REPORT

PREPARED FOR

Attn: Heather Levesque
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Generated 1/20/2023 3:21:48 PM Revision 3

JOB DESCRIPTION

Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

JOB NUMBER

680-224348-1


Eurofins Savannah

Job Notes

The test results in this report meet NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted. Results pertain only to samples listed in this report. This report may not be reproduced, except in full, without the written approval of the laboratory. Questions should be directed to the person who signed this report.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization



Generated
1/20/2023 3:21:48 PM
Revision 3

Authorized for release by
Jerry Lanier, Project Manager I
Jerry.Lanier@et.eurofinsus.com
(912)250-0281

Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

GC/MS Semi VOA

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

GC Semi VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

Metals

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present

Eurofins Savannah

Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

1

2

3

4

5

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11

12

Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-224348-1	DCL LEACHATE-FAL22	Water	10/27/22 12:00	10/29/22 09:45

1

2

3

4

5

6

7

8

9

10

11

12

Case Narrative

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Job ID: 680-224348-1

Laboratory: Eurofins Savannah

Narrative

Job Narrative 680-224348-1

Receipt

The sample was received on 10/29/2022 9:45 AM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 3.4°C

GC/MS VOA

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC/MS Semi VOA

Method 625_DOD: In preparation batch 280-592592, the following sample was analyzed outside of analytical holding time due to insufficient time remaining to extract the sample within hold once received in Denver: DCL Leachate-FAL22 (680-224348-1). Holding time expired: 11/03/22. Sample was extracted 11/07/22. Method: 625_DOD.

Method 625_DOD: In preparation batch 280-592592, due to the matrix, the initial volume(s) used for the following sample deviated from the standard procedure: DCL Leachate-FAL22 (680-224348-1). The reporting limits (RLs) have been adjusted proportionately. See internal comments. Method: 625.1//625_DOD

Method 625_DOD: Insufficient sample volume was available to perform an 8270_LCS and 8270_AP9_LCS matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 280-592592.

Method 625_DOD: Surrogate recovery for the following sample in preparation batch 280-592592 and analytical batch 280-593651 was outside control limits: DCL Leachate-FAL22 (680-224348-1). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Method 625_DOD: The continuing calibration verification (CCV) associated with batch 280-593651 recovered outside acceptance criteria, low biased, for Benzidine. A reporting limit (RL) standard was analyzed, and the target analytes are detected. Since the associated samples were non-detect for the analyte, the data are reported.

Method 625_DOD: The laboratory control sample (LCS) and the laboratory control sample duplicate (LCSD) for preparation batch 280-592592 and analytical batch 280-593651 recovered outside control limits for the following analytes: Hexachlorocyclopentadiene. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported. DCL Leachate-FAL22 (680-224348-1), (LCS 280-592592/2-A) and (LCSD 280-592592/3-A)

Method 625_DOD: The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for preparation batch 280-592592 and analytical batch 280-593651 recovered outside control limits for the following analytes: Benzidine.

Method 625_DOD: The laboratory control sample duplicate (LCSD) in preparation batch 280-592592 and analytical batch 280-593651 recovered low biased for the following analyte: N-Nitrosodimethylamine. The associated samples are outside of 2X hold, therefore the data has been reported. DCL Leachate-FAL22 (680-224348-1) and (LCSD 280-592592/3-A)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Diesel Range Organics

Method 8015C_DRO_DOD5: A portion of the following samples listed were used for analysis, rather than testing the entire sample amount in the original container, due to the sample container was not the appropriate size: DCL Leachate-FAL22 (680-224348-1). As such, the required solvent rinse of the original container could not be performed.

Method 8015C_DRO_DOD5: The following samples listed formed emulsions during the extraction procedure: DCL Leachate-FAL22 (680-224348-1). The emulsions were broken up using Sodium Sulfate.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Case Narrative

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Job ID: 680-224348-1 (Continued)

Laboratory: Eurofins Savannah (Continued)

Pesticides/PCBs

Method 8081B_8082A_D5: The continuing calibration verification (CCV) associated with batch 680-749075 recovered above the upper control limit for Endrin, Heptachlor, PCB-1248 and PCB-1260. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data has been reported. The associated samples are impacted: DCL Leachate-FAL22 (680-224348-1) and (680-224346-G-2-B).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

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Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Client Sample ID: DCL LEACHATE-FAL22

Lab Sample ID: 680-224348-1

Date Collected: 10/27/22 12:00

Matrix: Water

Date Received: 10/29/22 09:45

Method: 40CFR136A 624 - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,1,1-Trichloroethane	0.50	U	1.0	0.50	0.39	ug/L		11/10/22 15:07	1
1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21	ug/L		11/10/22 15:07	1
1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27	ug/L		11/10/22 15:07	1
1,1-Dichloroethane	0.80	U	1.0	0.80	0.22	ug/L		11/10/22 15:07	1
1,1-Dichloroethene	0.80	U	1.0	0.80	0.23	ug/L		11/10/22 15:07	1
1,2-Dichlorobenzene	0.50	U	1.0	0.50	0.37	ug/L		11/10/22 15:07	1
1,2-Dichloroethane	0.80	U	1.0	0.80	0.54	ug/L		11/10/22 15:07	1
1,2-Dichloroethene, Total	0.39	J	1.0	0.40	0.32	ug/L		11/10/22 15:07	1
1,2-Dichloropropane	0.80	U	1.0	0.80	0.52	ug/L		11/10/22 15:07	1
1,3-Dichlorobenzene	0.40	U	1.0	0.40	0.33	ug/L		11/10/22 15:07	1
1,4-Dichlorobenzene	0.50	U	1.0	0.50	0.39	ug/L		11/10/22 15:07	1
2-Butanone (MEK)	12	U	15	12	5.9	ug/L		11/10/22 15:07	1
2-Hexanone	4.0	U	5.0	4.0	1.7	ug/L		11/10/22 15:07	1
4-Methyl-2-pentanone (MIBK)	3.2	U	5.0	3.2	0.98	ug/L		11/10/22 15:07	1
Acetone	8.0	U	15	8.0	6.6	ug/L		11/10/22 15:07	1
Benzene	0.80	U	1.0	0.80	0.31	ug/L		11/10/22 15:07	1
Bromoform	1.8	U	2.0	1.8	1.2	ug/L		11/10/22 15:07	1
Bromomethane	4.0	U	5.0	4.0	2.4	ug/L		11/10/22 15:07	1
Carbon disulfide	0.80	U	2.0	0.80	0.63	ug/L		11/10/22 15:07	1
Carbon tetrachloride	0.80	U	1.0	0.80	0.57	ug/L		11/10/22 15:07	1
Chlorobenzene	0.80	U	1.0	0.80	0.42	ug/L		11/10/22 15:07	1
Chlorodibromomethane	1.8	U	2.0	1.8	0.62	ug/L		11/10/22 15:07	1
Chloroethane	1.6	U	4.0	1.6	1.4	ug/L		11/10/22 15:07	1
Chloroform	0.80	U	1.0	0.80	0.36	ug/L		11/10/22 15:07	1
Chloromethane	1.0	U	2.0	1.0	0.75	ug/L		11/10/22 15:07	1
cis-1,2-Dichloroethene	0.39	J	1.0	0.40	0.32	ug/L		11/10/22 15:07	1
cis-1,3-Dichloropropene	1.8	U	2.0	1.8	0.63	ug/L		11/10/22 15:07	1
Dichlorobromomethane	0.50	U	1.0	0.50	0.39	ug/L		11/10/22 15:07	1
Dichlorodifluoromethane	2.5	U	3.0	2.5	0.96	ug/L		11/10/22 15:07	1
Ethylbenzene	0.40	U	1.0	0.40	0.30	ug/L		11/10/22 15:07	1
Ethylene Dibromide	0.80	U	1.0	0.80	0.40	ug/L		11/10/22 15:07	1
Methyl tert-butyl ether	0.80	U	5.0	0.80	0.25	ug/L		11/10/22 15:07	1
Methylene Chloride	1.8	U	2.0	1.8	0.94	ug/L		11/10/22 15:07	1
m-Xylene & p-Xylene	0.80	U	2.0	0.80	0.36	ug/L		11/10/22 15:07	1
o-Xylene	0.40	U	1.0	0.40	0.33	ug/L		11/10/22 15:07	1
Styrene	0.80	U	1.0	0.80	0.36	ug/L		11/10/22 15:07	1
Tetrachloroethene	0.80	U	1.0	0.80	0.40	ug/L		11/10/22 15:07	1
Toluene	0.40	U	1.0	0.40	0.32	ug/L		11/10/22 15:07	1
trans-1,2-Dichloroethene	0.50	U	1.0	0.50	0.37	ug/L		11/10/22 15:07	1
trans-1,3-Dichloropropene	1.8	U	2.0	1.8	0.65	ug/L		11/10/22 15:07	1
Trichloroethene	0.40	U	1.0	0.40	0.30	ug/L		11/10/22 15:07	1
Trichlorofluoromethane	0.80	U	2.0	0.80	0.57	ug/L		11/10/22 15:07	1
Vinyl chloride	1.0	U	2.0	1.0	0.51	ug/L		11/10/22 15:07	1
Xylenes, Total	0.80	U	1.0	0.80	0.33	ug/L		11/10/22 15:07	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	106		73 - 122		11/10/22 15:07	1
4-Bromofluorobenzene (Surr)	96		79 - 119		11/10/22 15:07	1
Toluene-d8 (Surr)	102		80 - 120		11/10/22 15:07	1

Eurofins Savannah

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Client Sample ID: DCL LEACHATE-FAL22

Lab Sample ID: 680-224348-1

Date Collected: 10/27/22 12:00

Matrix: Water

Date Received: 10/29/22 09:45

Method: 40CFR136A 625 - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	64	U H	80	64	25	ug/L		11/17/22 01:34	1
1,2-Dichlorobenzene	64	U H	80	64	4.6	ug/L		11/17/22 01:34	1
1,3-Dichlorobenzene	160	U H	200	160	6.0	ug/L		11/17/22 01:34	1
1,4-Dichlorobenzene	64	U H	80	64	26	ug/L		11/17/22 01:34	1
2,2'-oxybis[1-chloropropane]	160	U H	200	160	5.6	ug/L		11/17/22 01:34	1
2,4,6-Trichlorophenol	160	U H	200	160	11	ug/L		11/17/22 01:34	1
2,4-Dichlorophenol	160	U H	200	160	13	ug/L		11/17/22 01:34	1
2,4-Dimethylphenol	160	U H	200	160	12	ug/L		11/17/22 01:34	1
2-Chloronaphthalene	64	U H	80	64	11	ug/L		11/17/22 01:34	1
2-Chlorophenol	160	U H	200	160	19	ug/L		11/17/22 01:34	1
2-Nitrophenol	160	U H	200	160	28	ug/L		11/17/22 01:34	1
3,3'-Dichlorobenzidine	600	U H Q	1000	600	62	ug/L		11/17/22 01:34	1
4,6-Dinitro-2-methylphenol	600	U H	1000	600	180	ug/L		11/17/22 01:34	1
4-Bromophenyl phenyl ether	160	U H	200	160	8.6	ug/L		11/17/22 01:34	1
4-Chloro-3-methylphenol	160	U H	200	160	48	ug/L		11/17/22 01:34	1
4-Chlorophenyl phenyl ether	160	U H	200	160	33	ug/L		11/17/22 01:34	1
4-Nitrophenol	180	U M H	200	180	63	ug/L		11/17/22 01:34	1
Acenaphthene	64	U H	80	64	13	ug/L		11/17/22 01:34	1
Acenaphthylene	64	U H	80	64	9.8	ug/L		11/17/22 01:34	1
Anthracene	64	U H	80	64	8.4	ug/L		11/17/22 01:34	1
Benzidine	2000	U H Q	2000	2000	1000	ug/L		11/17/22 01:34	1
Benzo[a]anthracene	64	U M H	80	64	18	ug/L		11/17/22 01:34	1
Benzo[a]pyrene	64	U M H	80	64	15	ug/L		11/17/22 01:34	1
Benzo[b]fluoranthene	64	U H	80	64	26	ug/L		11/17/22 01:34	1
Benzo[g,h,i]perylene	64	U H	80	64	10	ug/L		11/17/22 01:34	1
Benzo[k]fluoranthene	64	U H	80	64	9.2	ug/L		11/17/22 01:34	1
Bis(2-chloroethoxy)methane	160	U H	200	160	19	ug/L		11/17/22 01:34	1
Bis(2-chloroethyl)ether	160	U H	200	160	17	ug/L		11/17/22 01:34	1
Bis(2-ethylhexyl) phthalate	160	U M H	200	160	49	ug/L		11/17/22 01:34	1
Butyl benzyl phthalate	64	U H	80	64	20	ug/L		11/17/22 01:34	1
Chrysene	64	U H	80	64	11	ug/L		11/17/22 01:34	1
Dibenz(a,h)anthracene	160	U H	200	160	44	ug/L		11/17/22 01:34	1
Diethyl phthalate	20	U H	80	20	7.6	ug/L		11/17/22 01:34	1
Dimethyl phthalate	64	U H	80	64	4.2	ug/L		11/17/22 01:34	1
Di-n-butyl phthalate	64	U M H	80	64	23	ug/L		11/17/22 01:34	1
Di-n-octyl phthalate	160	U M H	200	160	80	ug/L		11/17/22 01:34	1
Fluoranthene	64	U H	80	64	18	ug/L		11/17/22 01:34	1
Fluorene	64	U H	80	64	6.2	ug/L		11/17/22 01:34	1
Hexachlorobenzene	160	U H	200	160	13	ug/L		11/17/22 01:34	1
Hexachlorobutadiene	160	U H	200	160	66	ug/L		11/17/22 01:34	1
Hexachlorocyclopentadiene	600	U H Q	1000	600	62	ug/L		11/17/22 01:34	1
Hexachloroethane	160	U H	200	160	20	ug/L		11/17/22 01:34	1
Indeno[1,2,3-cd]pyrene	160	U H	200	160	62	ug/L		11/17/22 01:34	1
Isophorone	160	U M H	200	160	4.2	ug/L		11/17/22 01:34	1
Naphthalene	40	U H	80	40	5.8	ug/L		11/17/22 01:34	1
Nitrobenzene	160	U M H	200	160	16	ug/L		11/17/22 01:34	1
N-Nitrosodi-n-propylamine	160	U H	200	160	7.0	ug/L		11/17/22 01:34	1
N-Nitrosodiphenylamine	160	U H	200	160	8.8	ug/L		11/17/22 01:34	1
Pentachlorophenol	800	U H	1000	800	400	ug/L		11/17/22 01:34	1

Eurofins Savannah

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Client Sample ID: DCL LEACHATE-FAL22

Lab Sample ID: 680-224348-1

Date Collected: 10/27/22 12:00

Matrix: Water

Date Received: 10/29/22 09:45

Method: 40CFR136A 625 - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Phenanthrene	64	U M H	80	64	14	ug/L		11/17/22 01:34	1
Phenol	160	U H	200	160	40	ug/L		11/17/22 01:34	1
Pyrene	160	U M H	200	160	7.4	ug/L		11/17/22 01:34	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	62		16 - 147	11/07/22 13:11	11/17/22 01:34	1
2-Fluorobiphenyl	44		43 - 120	11/07/22 13:11	11/17/22 01:34	1
2-Fluorophenol	17		16 - 136	11/07/22 13:11	11/17/22 01:34	1
Nitrobenzene-d5	40	Q	52 - 120	11/07/22 13:11	11/17/22 01:34	1
Phenol-d5	8	Q	11 - 145	11/07/22 13:11	11/17/22 01:34	1
Terphenyl-d14	86		10 - 145	11/07/22 13:11	11/17/22 01:34	1

Method: SW846 8015C DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C10-C28	0.15	U	0.30	0.15	0.068	mg/L		11/05/22 01:17	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	79	M	56 - 125	11/03/22 22:57	11/05/22 01:17	1

Method: SW846 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chlordane (technical)	0.37	U	0.46	0.37	0.15	ug/L		11/05/22 20:24	1
delta-BHC	0.0037	U	0.046	0.0037	0.0019	ug/L		11/05/22 20:24	1
Dieldrin	0.0037	U	0.046	0.0037	0.0019	ug/L		11/05/22 20:24	1
Endosulfan I	0.0037	U	0.046	0.0037	0.0019	ug/L		11/05/22 20:24	1
Endosulfan II	0.0037	U	0.046	0.0037	0.0019	ug/L		11/05/22 20:24	1
Endosulfan sulfate	0.0037	U	0.046	0.0037	0.0019	ug/L		11/05/22 20:24	1
Endrin	0.0037	U Q	0.046	0.0037	0.00093	ug/L		11/05/22 20:24	1
Endrin aldehyde	0.015	U	0.046	0.015	0.0037	ug/L		11/05/22 20:24	1
Endrin ketone	0.015	U M	0.046	0.015	0.0037	ug/L		11/05/22 20:24	1
gamma-BHC (Lindane)	0.0037	U	0.046	0.0037	0.00093	ug/L		11/05/22 20:24	1
Heptachlor	0.0037	U Q	0.046	0.0037	0.00093	ug/L		11/05/22 20:24	1
Heptachlor epoxide	0.0037	U	0.046	0.0037	0.0019	ug/L		11/05/22 20:24	1
Methoxychlor	0.0037	U M	0.046	0.0037	0.0019	ug/L		11/05/22 20:24	1
Toxaphene	0.74	U M	4.6	0.74	0.29	ug/L		11/05/22 20:24	1
4,4'-DDD	0.0037	U M	0.046	0.0037	0.0019	ug/L		11/05/22 20:24	1
4,4'-DDE	0.0037	U M	0.046	0.0037	0.00093	ug/L		11/05/22 20:24	1
4,4'-DDT	0.0019	J	0.046	0.0037	0.00093	ug/L		11/05/22 20:24	1
Aldrin	0.0037	U	0.046	0.0037	0.0019	ug/L		11/05/22 20:24	1
alpha-BHC	0.0037	U	0.046	0.0037	0.00093	ug/L		11/05/22 20:24	1
beta-BHC	0.0037	U	0.046	0.0037	0.0019	ug/L		11/05/22 20:24	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	80		14 - 130	11/03/22 17:37	11/05/22 20:24	1
Tetrachloro-m-xylene	73		44 - 124	11/03/22 17:37	11/05/22 20:24	1

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Aluminum	150	U	200	150	54	ug/L		11/03/22 19:35	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		11/03/22 19:35	1
Chromium	4.0	U	10	4.0	1.1	ug/L		11/03/22 19:35	1

Eurofins Savannah

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Client Sample ID: DCL LEACHATE-FAL22

Lab Sample ID: 680-224348-1

Date Collected: 10/27/22 12:00

Matrix: Water

Date Received: 10/29/22 09:45

Method: SW846 6010C - Metals (ICP) - Total Recoverable (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Copper	10	U	20	10	3.2	ug/L		11/03/22 19:35	1
Lead	20	U	40	20	6.6	ug/L		11/03/22 19:35	1
Nickel	10	U	40	10	3.3	ug/L		11/03/22 19:35	1
Silver	5.0	U	10	5.0	1.5	ug/L		11/03/22 19:35	1
Zinc	20	U	25	20	8.7	ug/L		11/03/22 19:35	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	4.2	J	5.0	3.0	0.86	ug/L		11/03/22 17:42	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		11/02/22 00:26	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Cyanide, Total (EPA 9012B)	0.013		0.010	0.0050	0.0025	mg/L		11/09/22 15:59	1
pH (SW846 9040C)	6.4	HF	2.0	2.0	2.0	SU		11/07/22 12:45	1
Phenolics, Total Recoverable (SW846 9065)	0.050	U	0.050	0.050	0.025	mg/L		11/03/22 19:51	1
Total Suspended Solids (SM 2540D)	21		4.0	2.8	1.1	mg/L		11/02/22 12:03	1

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Method: 624 - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 280-593004/7
Matrix: Water
Analysis Batch: 593004

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB	MB	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
1,1,1-Trichloroethane	0.50	U	1.0	0.50	0.39	ug/L		11/10/22 12:10	1
1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21	ug/L		11/10/22 12:10	1
1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27	ug/L		11/10/22 12:10	1
1,1-Dichloroethane	0.80	U	1.0	0.80	0.22	ug/L		11/10/22 12:10	1
1,1-Dichloroethene	0.80	U	1.0	0.80	0.23	ug/L		11/10/22 12:10	1
1,2-Dichlorobenzene	0.50	U	1.0	0.50	0.37	ug/L		11/10/22 12:10	1
1,2-Dichloroethane	0.80	U	1.0	0.80	0.54	ug/L		11/10/22 12:10	1
1,2-Dichloroethene, Total	0.40	U	1.0	0.40	0.32	ug/L		11/10/22 12:10	1
1,2-Dichloropropane	0.80	U	1.0	0.80	0.52	ug/L		11/10/22 12:10	1
1,3-Dichlorobenzene	0.40	U	1.0	0.40	0.33	ug/L		11/10/22 12:10	1
1,4-Dichlorobenzene	0.50	U	1.0	0.50	0.39	ug/L		11/10/22 12:10	1
2-Butanone (MEK)	12	U	15	12	5.9	ug/L		11/10/22 12:10	1
2-Hexanone	4.0	U	5.0	4.0	1.7	ug/L		11/10/22 12:10	1
4-Methyl-2-pentanone (MIBK)	3.2	U	5.0	3.2	0.98	ug/L		11/10/22 12:10	1
Acetone	8.0	U	15	8.0	6.6	ug/L		11/10/22 12:10	1
Benzene	0.80	U	1.0	0.80	0.31	ug/L		11/10/22 12:10	1
Bromoform	1.8	U	2.0	1.8	1.2	ug/L		11/10/22 12:10	1
Bromomethane	4.0	U	5.0	4.0	2.4	ug/L		11/10/22 12:10	1
Carbon disulfide	0.80	U	2.0	0.80	0.63	ug/L		11/10/22 12:10	1
Carbon tetrachloride	0.80	U	1.0	0.80	0.57	ug/L		11/10/22 12:10	1
Chlorobenzene	0.80	U	1.0	0.80	0.42	ug/L		11/10/22 12:10	1
Chlorodibromomethane	1.8	U	2.0	1.8	0.62	ug/L		11/10/22 12:10	1
Chloroethane	1.6	U	4.0	1.6	1.4	ug/L		11/10/22 12:10	1
Chloroform	0.80	U	1.0	0.80	0.36	ug/L		11/10/22 12:10	1
Chloromethane	1.0	U	2.0	1.0	0.75	ug/L		11/10/22 12:10	1
cis-1,2-Dichloroethene	0.40	U	1.0	0.40	0.32	ug/L		11/10/22 12:10	1
cis-1,3-Dichloropropene	1.8	U	2.0	1.8	0.63	ug/L		11/10/22 12:10	1
Dichlorobromomethane	0.50	U	1.0	0.50	0.39	ug/L		11/10/22 12:10	1
Dichlorodifluoromethane	2.5	U	3.0	2.5	0.96	ug/L		11/10/22 12:10	1
Ethylbenzene	0.40	U	1.0	0.40	0.30	ug/L		11/10/22 12:10	1
Ethylene Dibromide	0.80	U	1.0	0.80	0.40	ug/L		11/10/22 12:10	1
Methyl tert-butyl ether	0.80	U	5.0	0.80	0.25	ug/L		11/10/22 12:10	1
Methylene Chloride	1.08	J	2.0	1.8	0.94	ug/L		11/10/22 12:10	1
m-Xylene & p-Xylene	0.80	U	2.0	0.80	0.36	ug/L		11/10/22 12:10	1
o-Xylene	0.40	U	1.0	0.40	0.33	ug/L		11/10/22 12:10	1
Styrene	0.80	U	1.0	0.80	0.36	ug/L		11/10/22 12:10	1
Tetrachloroethene	0.80	U	1.0	0.80	0.40	ug/L		11/10/22 12:10	1
Toluene	0.40	U	1.0	0.40	0.32	ug/L		11/10/22 12:10	1
trans-1,2-Dichloroethene	0.50	U	1.0	0.50	0.37	ug/L		11/10/22 12:10	1
trans-1,3-Dichloropropene	1.8	U	2.0	1.8	0.65	ug/L		11/10/22 12:10	1
Trichloroethene	0.40	U	1.0	0.40	0.30	ug/L		11/10/22 12:10	1
Trichlorofluoromethane	0.80	U	2.0	0.80	0.57	ug/L		11/10/22 12:10	1
Vinyl chloride	1.0	U	2.0	1.0	0.51	ug/L		11/10/22 12:10	1
Xylenes, Total	0.80	U	1.0	0.80	0.33	ug/L		11/10/22 12:10	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
1,2-Dichloroethane-d4 (Surr)	106		73 - 122		11/10/22 12:10	1
4-Bromofluorobenzene (Surr)	96		79 - 119		11/10/22 12:10	1

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Method: 624 - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 280-593004/7
Matrix: Water
Analysis Batch: 593004

Client Sample ID: Method Blank
Prep Type: Total/NA

<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
<i>Toluene-d8 (Surr)</i>	102		80 - 120		11/10/22 12:10	1

Lab Sample ID: LCS 280-593004/1002
Matrix: Water
Analysis Batch: 593004

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,1,1-Trichloroethane	25.0	26.2		ug/L		105	70 - 130
1,1,2,2-Tetrachloroethane	25.0	23.8		ug/L		95	60 - 140
1,1,2-Trichloroethane	25.0	24.8		ug/L		99	70 - 130
1,1-Dichloroethane	25.0	24.6		ug/L		98	70 - 130
1,1-Dichloroethene	25.0	22.9		ug/L		91	50 - 150
1,2-Dichlorobenzene	25.0	25.1		ug/L		100	65 - 135
1,2-Dichloroethane	25.0	25.7		ug/L		103	70 - 130
1,2-Dichloroethene, Total	50.0	49.6		ug/L		99	75 - 130
1,2-Dichloropropane	25.0	24.5		ug/L		98	35 - 165
1,3-Dichlorobenzene	25.0	24.6		ug/L		98	70 - 130
1,4-Dichlorobenzene	25.0	24.0		ug/L		96	65 - 135
2-Butanone (MEK)	100	103		ug/L		103	49 - 153
2-Hexanone	100	101		ug/L		101	50 - 154
4-Methyl-2-pentanone (MIBK)	100	104		ug/L		104	48 - 157
Acetone	100	101		ug/L		101	44 - 168
Benzene	25.0	24.9		ug/L		100	65 - 135
Bromoform	25.0	22.3		ug/L		89	70 - 130
Bromomethane	25.0	23.5		ug/L		94	15 - 185
Carbon disulfide	25.0	21.4		ug/L		86	61 - 138
Carbon tetrachloride	25.0	25.3		ug/L		101	70 - 130
Chlorobenzene	25.0	24.2		ug/L		97	65 - 135
Chlorodibromomethane	25.0	23.2		ug/L		93	70 - 135
Chloroethane	25.0	24.9		ug/L		100	40 - 160
Chloroform	25.0	26.1		ug/L		104	70 - 135
Chloromethane	25.0	22.4		ug/L		89	10 - 205
cis-1,2-Dichloroethene	25.0	25.2		ug/L		101	76 - 128
cis-1,3-Dichloropropene	25.0	23.7		ug/L		95	25 - 175
Dichlorobromomethane	25.0	24.8		ug/L		99	65 - 135
Dichlorodifluoromethane	25.0	19.2		ug/L		77	32 - 152
Ethylbenzene	25.0	24.9		ug/L		99	60 - 140
Ethylene Dibromide	25.0	23.2		ug/L		93	77 - 126
Methyl tert-butyl ether	25.0	25.2		ug/L		101	74 - 128
Methylene Chloride	25.0	25.2		ug/L		101	60 - 140
m-Xylene & p-Xylene	25.0	24.9		ug/L		100	78 - 128
o-Xylene	25.0	25.1		ug/L		101	80 - 127
Styrene	25.0	24.5		ug/L		98	76 - 130
Tetrachloroethene	25.0	25.8		ug/L		103	70 - 130
Toluene	25.0	25.6		ug/L		103	70 - 130
trans-1,2-Dichloroethene	25.0	24.4		ug/L		98	70 - 130
trans-1,3-Dichloropropene	25.0	23.7		ug/L		95	50 - 150
Trichloroethene	25.0	24.9		ug/L		100	65 - 135

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Method: 624 - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 280-593004/1002
Matrix: Water
Analysis Batch: 593004

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Trichlorofluoromethane	25.0	25.8		ug/L		103	50 - 150
Vinyl chloride	25.0	23.5		ug/L		94	10 - 195
Xylenes, Total	50.0	50.0		ug/L		100	80 - 127

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	105		73 - 122
4-Bromofluorobenzene (Surr)	98		79 - 119
Toluene-d8 (Surr)	103		80 - 120

Lab Sample ID: LCSD 280-593004/4
Matrix: Water
Analysis Batch: 593004

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,1,1-Trichloroethane	25.0	29.7		ug/L		119	70 - 130	13	30
1,1,2,2-Tetrachloroethane	25.0	25.7		ug/L		103	60 - 140	8	30
1,1,2-Trichloroethane	25.0	28.9		ug/L		115	70 - 130	15	30
1,1-Dichloroethane	25.0	28.2		ug/L		113	70 - 130	14	30
1,1-Dichloroethene	25.0	26.2		ug/L		105	50 - 150	14	30
1,2-Dichlorobenzene	25.0	27.9		ug/L		112	65 - 135	11	30
1,2-Dichloroethane	25.0	29.2		ug/L		117	70 - 130	13	30
1,2-Dichloroethene, Total	50.0	57.0		ug/L		114	75 - 130	14	30
1,2-Dichloropropane	25.0	28.7		ug/L		115	35 - 165	16	30
1,3-Dichlorobenzene	25.0	28.2		ug/L		113	70 - 130	14	30
1,4-Dichlorobenzene	25.0	27.0		ug/L		108	65 - 135	12	30
2-Butanone (MEK)	100	113		ug/L		113	49 - 153	9	32
2-Hexanone	100	111		ug/L		111	50 - 154	10	30
4-Methyl-2-pentanone (MIBK)	100	114		ug/L		114	48 - 157	10	30
Acetone	100	110		ug/L		110	44 - 168	8	30
Benzene	25.0	28.6		ug/L		114	65 - 135	14	30
Bromoform	25.0	23.9		ug/L		96	70 - 130	7	30
Bromomethane	25.0	29.8		ug/L		119	15 - 185	24	30
Carbon disulfide	25.0	23.1		ug/L		92	61 - 138	7	30
Carbon tetrachloride	25.0	28.0		ug/L		112	70 - 130	10	30
Chlorobenzene	25.0	28.1		ug/L		112	65 - 135	15	30
Chlorodibromomethane	25.0	25.4		ug/L		102	70 - 135	9	30
Chloroethane	25.0	25.5		ug/L		102	40 - 160	2	30
Chloroform	25.0	29.6		ug/L		119	70 - 135	13	30
Chloromethane	25.0	24.5		ug/L		98	10 - 205	9	30
cis-1,2-Dichloroethene	25.0	29.5		ug/L		118	76 - 128	16	30
cis-1,3-Dichloropropene	25.0	26.2		ug/L		105	25 - 175	10	30
Dichlorobromomethane	25.0	27.5		ug/L		110	65 - 135	10	30
Dichlorodifluoromethane	25.0	19.8		ug/L		79	32 - 152	3	30
Ethylbenzene	25.0	28.4		ug/L		114	60 - 140	13	30
Ethylene Dibromide	25.0	26.9		ug/L		108	77 - 126	15	30
Methyl tert-butyl ether	25.0	29.0		ug/L		116	74 - 128	14	30
Methylene Chloride	25.0	28.7		ug/L		115	60 - 140	13	30
m-Xylene & p-Xylene	25.0	28.2		ug/L		113	78 - 128	13	30

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Method: 624 - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 280-593004/4
Matrix: Water
Analysis Batch: 593004

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
o-Xylene	25.0	28.6		ug/L		114	80 - 127	13	30
Styrene	25.0	27.8		ug/L		111	76 - 130	13	30
Tetrachloroethene	25.0	28.8		ug/L		115	70 - 130	11	30
Toluene	25.0	29.7		ug/L		119	70 - 130	15	30
trans-1,2-Dichloroethene	25.0	27.5		ug/L		110	70 - 130	12	30
trans-1,3-Dichloropropene	25.0	27.4		ug/L		110	50 - 150	14	30
Trichloroethene	25.0	28.4		ug/L		113	65 - 135	13	30
Trichlorofluoromethane	25.0	25.8		ug/L		103	50 - 150	0	30
Vinyl chloride	25.0	25.4		ug/L		102	10 - 195	8	30
Xylenes, Total	50.0	56.8		ug/L		114	80 - 127	13	30

Surrogate	LCSD %Recovery	LCSD Qualifier	LCSD Limits
1,2-Dichloroethane-d4 (Surr)	103		73 - 122
4-Bromofluorobenzene (Surr)	97		79 - 119
Toluene-d8 (Surr)	102		80 - 120

Method: 625 - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 280-592592/1-A
Matrix: Water
Analysis Batch: 593651

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 592592

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	3.2	U	4.0	3.2	1.3	ug/L		11/16/22 17:43	1
1,2-Dichlorobenzene	3.2	U	4.0	3.2	0.23	ug/L		11/16/22 17:43	1
1,3-Dichlorobenzene	8.0	U	10	8.0	0.30	ug/L		11/16/22 17:43	1
1,4-Dichlorobenzene	3.2	U	4.0	3.2	1.3	ug/L		11/16/22 17:43	1
2,2'-oxybis[1-chloropropane]	8.0	U	10	8.0	0.28	ug/L		11/16/22 17:43	1
2,4,6-Trichlorophenol	8.0	U	10	8.0	0.56	ug/L		11/16/22 17:43	1
2,4-Dichlorophenol	8.0	U	10	8.0	0.64	ug/L		11/16/22 17:43	1
2,4-Dimethylphenol	8.0	U	10	8.0	0.58	ug/L		11/16/22 17:43	1
2-Chloronaphthalene	3.2	U	4.0	3.2	0.53	ug/L		11/16/22 17:43	1
2-Chlorophenol	8.0	U	10	8.0	0.97	ug/L		11/16/22 17:43	1
2-Nitrophenol	8.0	U	10	8.0	1.4	ug/L		11/16/22 17:43	1
3,3'-Dichlorobenzidine	30	U	50	30	3.1	ug/L		11/16/22 17:43	1
4,6-Dinitro-2-methylphenol	30	U	50	30	9.1	ug/L		11/16/22 17:43	1
4-Bromophenyl phenyl ether	8.0	U	10	8.0	0.43	ug/L		11/16/22 17:43	1
4-Chloro-3-methylphenol	8.0	U	10	8.0	2.4	ug/L		11/16/22 17:43	1
4-Chlorophenyl phenyl ether	8.0	U	10	8.0	1.7	ug/L		11/16/22 17:43	1
4-Nitrophenol	8.8	U M	10	8.8	3.2	ug/L		11/16/22 17:43	1
Acenaphthene	3.2	U	4.0	3.2	0.63	ug/L		11/16/22 17:43	1
Acenaphthylene	3.2	U	4.0	3.2	0.49	ug/L		11/16/22 17:43	1
Anthracene	3.2	U M	4.0	3.2	0.42	ug/L		11/16/22 17:43	1
Benzidine	100	U	100	100	50	ug/L		11/16/22 17:43	1
Benzo[a]anthracene	3.2	U M	4.0	3.2	0.90	ug/L		11/16/22 17:43	1
Benzo[a]pyrene	3.2	U M	4.0	3.2	0.73	ug/L		11/16/22 17:43	1
Benzo[b]fluoranthene	3.2	U M	4.0	3.2	1.3	ug/L		11/16/22 17:43	1
Benzo[g,h,i]perylene	3.2	U	4.0	3.2	0.50	ug/L		11/16/22 17:43	1
Benzo[k]fluoranthene	3.2	U M	4.0	3.2	0.46	ug/L		11/16/22 17:43	1

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Method: 625 - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 280-592592/1-A
Matrix: Water
Analysis Batch: 593651

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 592592

Analyte	MB	MB	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Bis(2-chloroethoxy)methane	8.0	U	10	8.0	0.97	ug/L		11/16/22 17:43	1
Bis(2-chloroethyl)ether	8.0	U	10	8.0	0.83	ug/L		11/16/22 17:43	1
Bis(2-ethylhexyl) phthalate	8.0	U	10	8.0	2.4	ug/L		11/16/22 17:43	1
Butyl benzyl phthalate	3.2	U M	4.0	3.2	1.0	ug/L		11/16/22 17:43	1
Chrysene	3.2	U M	4.0	3.2	0.54	ug/L		11/16/22 17:43	1
Dibenz(a,h)anthracene	8.0	U	10	8.0	2.2	ug/L		11/16/22 17:43	1
Diethyl phthalate	1.0	U	4.0	1.0	0.38	ug/L		11/16/22 17:43	1
Dimethyl phthalate	3.2	U M	4.0	3.2	0.21	ug/L		11/16/22 17:43	1
Di-n-butyl phthalate	3.2	U	4.0	3.2	1.2	ug/L		11/16/22 17:43	1
Di-n-octyl phthalate	8.0	U M	10	8.0	4.0	ug/L		11/16/22 17:43	1
Fluoranthene	3.2	U M	4.0	3.2	0.90	ug/L		11/16/22 17:43	1
Fluorene	3.2	U	4.0	3.2	0.31	ug/L		11/16/22 17:43	1
Hexachlorobenzene	8.0	U	10	8.0	0.66	ug/L		11/16/22 17:43	1
Hexachlorobutadiene	8.0	U	10	8.0	3.3	ug/L		11/16/22 17:43	1
Hexachlorocyclopentadiene	30	U	50	30	3.1	ug/L		11/16/22 17:43	1
Hexachloroethane	8.0	U	10	8.0	0.98	ug/L		11/16/22 17:43	1
Indeno[1,2,3-cd]pyrene	8.0	U	10	8.0	3.1	ug/L		11/16/22 17:43	1
Isophorone	8.0	U M	10	8.0	0.21	ug/L		11/16/22 17:43	1
Naphthalene	2.0	U	4.0	2.0	0.29	ug/L		11/16/22 17:43	1
Nitrobenzene	8.0	U M	10	8.0	0.81	ug/L		11/16/22 17:43	1
N-Nitrosodi-n-propylamine	8.0	U	10	8.0	0.35	ug/L		11/16/22 17:43	1
N-Nitrosodiphenylamine	8.0	U	10	8.0	0.44	ug/L		11/16/22 17:43	1
Pentachlorophenol	40	U	50	40	20	ug/L		11/16/22 17:43	1
Phenanthrene	3.2	U	4.0	3.2	0.69	ug/L		11/16/22 17:43	1
Phenol	8.0	U	10	8.0	2.0	ug/L		11/16/22 17:43	1
Pyrene	8.0	U M	10	8.0	0.37	ug/L		11/16/22 17:43	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
2,4,6-Tribromophenol	70		16 - 147	11/07/22 13:11	11/16/22 17:43	1
2-Fluorobiphenyl	65		43 - 120	11/07/22 13:11	11/16/22 17:43	1
2-Fluorophenol	25		16 - 136	11/07/22 13:11	11/16/22 17:43	1
Nitrobenzene-d5	62		52 - 120	11/07/22 13:11	11/16/22 17:43	1
Phenol-d5	13		11 - 145	11/07/22 13:11	11/16/22 17:43	1
Terphenyl-d14	87		10 - 145	11/07/22 13:11	11/16/22 17:43	1

Lab Sample ID: LCS 280-592592/2-A
Matrix: Water
Analysis Batch: 593651

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 592592

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,2-Dichlorobenzene	80.0	58.9		ug/L		74	32 - 129
1,3-Dichlorobenzene	80.0	56.5		ug/L		71	10 - 172
1,4-Dichlorobenzene	80.0	56.9		ug/L		71	20 - 124
2,2'-oxybis[1-chloropropane]	80.0	61.6		ug/L		77	36 - 166
2,4,6-Trichlorophenol	80.0	69.6		ug/L		87	37 - 144
2,4-Dichlorophenol	80.0	67.3		ug/L		84	39 - 135
2,4-Dimethylphenol	80.0	64.3		ug/L		80	32 - 119

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Method: 625 - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 280-592592/2-A
Matrix: Water
Analysis Batch: 593651

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 592592

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
2-Chloronaphthalene	80.0	63.3		ug/L		79	60 - 118
2-Chlorophenol	80.0	58.9		ug/L		74	23 - 134
2-Nitrophenol	80.0	68.8		ug/L		86	29 - 182
3,3'-Dichlorobenzidine	160	137		ug/L		86	10 - 262
4,6-Dinitro-2-methylphenol	160	151		ug/L		94	10 - 181
4-Bromophenyl phenyl ether	80.0	71.0		ug/L		89	53 - 127
4-Chloro-3-methylphenol	80.0	68.8		ug/L		86	22 - 147
4-Chlorophenyl phenyl ether	80.0	69.8		ug/L		87	25 - 158
4-Nitrophenol	160	47.9		ug/L		30	10 - 132
Acenaphthene	80.0	65.2		ug/L		82	47 - 145
Acenaphthylene	80.0	63.8		ug/L		80	33 - 145
Anthracene	80.0	70.0		ug/L		88	27 - 133
Benzidine	160	100	U	ug/L		22	5 - 65
Benzo[a]anthracene	80.0	72.4		ug/L		91	33 - 143
Benzo[a]pyrene	80.0	68.9		ug/L		86	17 - 163
Benzo[b]fluoranthene	80.0	69.4		ug/L		87	24 - 159
Benzo[g,h,i]perylene	80.0	84.4		ug/L		106	10 - 219
Benzo[k]fluoranthene	80.0	72.2		ug/L		90	11 - 162
Bis(2-chloroethoxy)methane	80.0	62.6		ug/L		78	33 - 184
Bis(2-chloroethyl)ether	80.0	62.0		ug/L		78	12 - 158
Bis(2-ethylhexyl) phthalate	80.0	78.8		ug/L		98	10 - 158
Butyl benzyl phthalate	80.0	73.7		ug/L		92	10 - 152
Chrysene	80.0	68.0		ug/L		85	17 - 168
Dibenz(a,h)anthracene	80.0	84.1		ug/L		105	10 - 227
Diethyl phthalate	80.0	71.6		ug/L		90	10 - 114
Dimethyl phthalate	80.0	70.3		ug/L		88	10 - 112
Di-n-butyl phthalate	80.0	75.7		ug/L		95	10 - 118
Di-n-octyl phthalate	80.0	77.3		ug/L		97	10 - 146
Fluoranthene	80.0	74.1		ug/L		93	26 - 137
Fluorene	80.0	70.3		ug/L		88	59 - 121
Hexachlorobenzene	80.0	71.6		ug/L		89	10 - 152
Hexachlorobutadiene	80.0	58.3		ug/L		73	24 - 116
Hexachlorocyclopentadiene	241	239	J1 Q	ug/L		99	10 - 68
Hexachloroethane	80.0	57.2		ug/L		72	40 - 113
Indeno[1,2,3-cd]pyrene	80.0	81.5		ug/L		102	10 - 171
Isophorone	80.0	65.5		ug/L		82	21 - 196
Naphthalene	80.0	60.2		ug/L		75	21 - 133
Nitrobenzene	80.0	61.0		ug/L		76	35 - 180
N-Nitrosodi-n-propylamine	80.0	73.5		ug/L		92	10 - 230
N-Nitrosodiphenylamine	80.0	67.1		ug/L		84	46 - 114
Pentachlorophenol	160	145		ug/L		91	14 - 176
Phenanthrene	80.0	69.4		ug/L		87	54 - 120
Phenol	80.0	18.5		ug/L		23	10 - 112
Pyrene	80.0	70.0		ug/L		87	55 - 115

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2,4,6-Tribromophenol	96		16 - 147
2-Fluorobiphenyl	77		43 - 120

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Method: 625 - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 280-592592/2-A
Matrix: Water
Analysis Batch: 593651

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 592592

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
2-Fluorophenol	36		16 - 136
Nitrobenzene-d5	74		52 - 120
Phenol-d5	22		11 - 145
Terphenyl-d14	83		10 - 145

Lab Sample ID: LCSD 280-592592/3-A
Matrix: Water
Analysis Batch: 593651

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 592592

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec		RPD	RPD Limit
							Limits	RPD		
1,2,4-Trichlorobenzene	80.0	54.2		ug/L		68	44 - 142	5	35	
1,2-Dichlorobenzene	80.0	52.9		ug/L		66	32 - 129	11	42	
1,3-Dichlorobenzene	80.0	51.3		ug/L		64	10 - 172	10	47	
1,4-Dichlorobenzene	80.0	52.3		ug/L		65	20 - 124	9	49	
2,2'-oxybis[1-chloropropane]	80.0	54.6		ug/L		68	36 - 166	12	30	
2,4,6-Trichlorophenol	80.0	67.4		ug/L		84	37 - 144	3	30	
2,4-Dichlorophenol	80.0	62.4		ug/L		78	39 - 135	7	30	
2,4-Dimethylphenol	80.0	63.0		ug/L		79	32 - 119	2	35	
2-Chloronaphthalene	80.0	60.2		ug/L		75	60 - 118	5	30	
2-Chlorophenol	80.0	53.1		ug/L		66	23 - 134	10	30	
2-Nitrophenol	80.0	66.2		ug/L		83	29 - 182	4	30	
3,3'-Dichlorobenzidine	160	136		ug/L		85	10 - 262	0	50	
4,6-Dinitro-2-methylphenol	160	153		ug/L		96	10 - 181	1	55	
4-Bromophenyl phenyl ether	80.0	70.3		ug/L		88	53 - 127	1	34	
4-Chloro-3-methylphenol	80.0	65.2		ug/L		81	22 - 147	5	30	
4-Chlorophenyl phenyl ether	80.0	67.8		ug/L		85	25 - 158	3	30	
4-Nitrophenol	160	48.6		ug/L		30	10 - 132	1	42	
Acenaphthene	80.0	63.1		ug/L		79	47 - 145	3	30	
Acenaphthylene	80.0	61.2		ug/L		76	33 - 145	4	30	
Anthracene	80.0	70.1		ug/L		88	27 - 133	0	30	
Benzidine	160	64.9	J Q	ug/L		41	5 - 65	59	50	
Benzo[a]anthracene	80.0	72.5		ug/L		91	33 - 143	0	30	
Benzo[a]pyrene	80.0	69.6		ug/L		87	17 - 163	1	73	
Benzo[b]fluoranthene	80.0	72.3		ug/L		90	24 - 159	4	90	
Benzo[g,h,i]perylene	80.0	85.2		ug/L		106	10 - 219	1	64	
Benzo[k]fluoranthene	80.0	69.1		ug/L		86	11 - 162	4	50	
Bis(2-chloroethoxy)methane	80.0	59.0		ug/L		74	33 - 184	6	30	
Bis(2-chloroethyl)ether	80.0	56.5		ug/L		71	12 - 158	9	30	
Bis(2-ethylhexyl) phthalate	80.0	78.1		ug/L		98	10 - 158	1	30	
Butyl benzyl phthalate	80.0	72.6		ug/L		91	10 - 152	1	30	
Chrysene	80.0	67.5		ug/L		84	17 - 168	1	30	
Dibenz(a,h)anthracene	80.0	84.8		ug/L		106	10 - 227	1	78	
Diethyl phthalate	80.0	70.5		ug/L		88	10 - 114	2	30	
Dimethyl phthalate	80.0	68.9		ug/L		86	10 - 112	2	30	
Di-n-butyl phthalate	80.0	73.7		ug/L		92	10 - 118	3	30	
Di-n-octyl phthalate	80.0	76.9		ug/L		96	10 - 146	1	30	
Fluoranthene	80.0	73.1		ug/L		91	26 - 137	1	30	
Fluorene	80.0	68.8		ug/L		86	59 - 121	2	30	

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Method: 625 - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 280-592592/3-A
Matrix: Water
Analysis Batch: 593651

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 592592

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Hexachlorobenzene	80.0	70.8		ug/L		89	10 - 152	1	30
Hexachlorobutadiene	80.0	52.7		ug/L		66	24 - 116	10	41
Hexachlorocyclopentadiene	241	230	J1 Q	ug/L		96	10 - 68	4	82
Hexachloroethane	80.0	51.4		ug/L		64	40 - 113	11	52
Indeno[1,2,3-cd]pyrene	80.0	82.7		ug/L		103	10 - 171	1	73
Isophorone	80.0	62.3		ug/L		78	21 - 196	5	30
Naphthalene	80.0	56.4		ug/L		70	21 - 133	7	30
Nitrobenzene	80.0	57.5		ug/L		72	35 - 180	6	30
N-Nitrosodi-n-propylamine	80.0	67.1		ug/L		84	10 - 230	9	30
N-Nitrosodiphenylamine	80.0	68.1		ug/L		85	46 - 114	1	50
Pentachlorophenol	160	150		ug/L		93	14 - 176	3	30
Phenanthrene	80.0	69.2		ug/L		86	54 - 120	0	30
Phenol	80.0	16.7		ug/L		21	10 - 112	10	30
Pyrene	80.0	68.9		ug/L		86	55 - 115	1	30

Surrogate	LCSD %Recovery	LCSD Qualifier	LCSD Limits
2,4,6-Tribromophenol	97		16 - 147
2-Fluorobiphenyl	73		43 - 120
2-Fluorophenol	31		16 - 136
Nitrobenzene-d5	70		52 - 120
Phenol-d5	20		11 - 145
Terphenyl-d14	81		10 - 145

Method: 8015C DRO - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 680-748754/1-A
Matrix: Water
Analysis Batch: 748883

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 748754

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C10-C28	0.15	U	0.30	0.15	0.068	mg/L		11/04/22 20:40	1

Surrogate	MB %Recovery	MB Qualifier	MB Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	77	M	56 - 125	11/03/22 22:57	11/04/22 20:40	1

Lab Sample ID: LCS 680-748754/2-A
Matrix: Water
Analysis Batch: 748883

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 748754

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
C10-C28	4.00	2.87		mg/L		72	36 - 132

Surrogate	LCS %Recovery	LCS Qualifier	LCS Limits
o-Terphenyl (Surr)	93	M	56 - 125

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Method: 8015C DRO - Diesel Range Organics (DRO) (GC) (Continued)

Lab Sample ID: LCSD 680-748754/3-A
Matrix: Water
Analysis Batch: 748883

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 748754

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
C10-C28	4.00	2.81		mg/L		70	36 - 132	2	30
Surrogate	%Recovery	Qualifier	Limits						
<i>o</i> -Terphenyl (Surr)	91	M	56 - 125						

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Lab Sample ID: MB 680-748736/1-A
Matrix: Water
Analysis Batch: 749075

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 748736

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chlordane (technical)	0.40	U	0.50	0.40	0.16	ug/L		11/05/22 17:55	1
delta-BHC	0.0040	U	0.050	0.0040	0.0020	ug/L		11/05/22 17:55	1
Dieldrin	0.0040	U	0.050	0.0040	0.0020	ug/L		11/05/22 17:55	1
Endosulfan I	0.0040	U	0.050	0.0040	0.0020	ug/L		11/05/22 17:55	1
Endosulfan II	0.0040	U	0.050	0.0040	0.0020	ug/L		11/05/22 17:55	1
Endosulfan sulfate	0.0040	U M	0.050	0.0040	0.0020	ug/L		11/05/22 17:55	1
Endrin	0.0040	U	0.050	0.0040	0.0010	ug/L		11/05/22 17:55	1
Endrin aldehyde	0.016	U	0.050	0.016	0.0040	ug/L		11/05/22 17:55	1
Endrin ketone	0.016	U	0.050	0.016	0.0040	ug/L		11/05/22 17:55	1
gamma-BHC (Lindane)	0.0040	U M	0.050	0.0040	0.0010	ug/L		11/05/22 17:55	1
Heptachlor	0.0040	U	0.050	0.0040	0.0010	ug/L		11/05/22 17:55	1
Heptachlor epoxide	0.0040	U	0.050	0.0040	0.0020	ug/L		11/05/22 17:55	1
Methoxychlor	0.0040	U	0.050	0.0040	0.0020	ug/L		11/05/22 17:55	1
Toxaphene	0.80	U	5.0	0.80	0.31	ug/L		11/05/22 17:55	1
4,4'-DDD	0.0040	U	0.050	0.0040	0.0020	ug/L		11/05/22 17:55	1
4,4'-DDE	0.0040	U	0.050	0.0040	0.0010	ug/L		11/05/22 17:55	1
4,4'-DDT	0.0040	U	0.050	0.0040	0.0010	ug/L		11/05/22 17:55	1
Aldrin	0.0040	U	0.050	0.0040	0.0020	ug/L		11/05/22 17:55	1
alpha-BHC	0.0040	U	0.050	0.0040	0.0010	ug/L		11/05/22 17:55	1
beta-BHC	0.0040	U M	0.050	0.0040	0.0020	ug/L		11/05/22 17:55	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>DCB</i> Decachlorobiphenyl	83		14 - 130				11/03/22 17:37	11/05/22 17:55	1
<i>Tetrachloro-m-xylene</i>	52		44 - 124				11/03/22 17:37	11/05/22 17:55	1

Lab Sample ID: LCS 680-748736/2-A
Matrix: Water
Analysis Batch: 749075

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 748736

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
delta-BHC	0.0400	0.0308	J	ug/L		77	52 - 142
Dieldrin	0.0400	0.0373	J	ug/L		93	60 - 136
Endosulfan I	0.0400	0.0336	J	ug/L		84	62 - 126
Endosulfan II	0.0400	0.0302	J	ug/L		75	52 - 135
Endosulfan sulfate	0.0400	0.0379	J	ug/L		95	62 - 133
Endrin	0.0400	0.0452	J	ug/L		113	60 - 138

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC) (Continued)

Lab Sample ID: LCS 680-748736/2-A
Matrix: Water
Analysis Batch: 749075

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 748736

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Endrin aldehyde	0.0400	0.0318	J	ug/L		79	51 - 132
Endrin ketone	0.0400	0.0348	J	ug/L		87	58 - 134
gamma-BHC (Lindane)	0.0400	0.0299	J	ug/L		75	59 - 134
Heptachlor	0.0400	0.0272	J	ug/L		68	54 - 130
Heptachlor epoxide	0.0400	0.0348	J	ug/L		87	61 - 133
Methoxychlor	0.0400	0.0395	J	ug/L		99	54 - 145
4,4'-DDD	0.0400	0.0437	J	ug/L		109	56 - 143
4,4'-DDE	0.0400	0.0379	J	ug/L		95	57 - 135
4,4'-DDT	0.0400	0.0383	J	ug/L		96	51 - 143
Aldrin	0.0400	0.0288	J	ug/L		72	45 - 134
alpha-BHC	0.0400	0.0285	J	ug/L		71	54 - 138
beta-BHC	0.0400	0.0366	J	ug/L		92	56 - 136

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
DCB Decachlorobiphenyl	63		14 - 130
Tetrachloro-m-xylene	58		44 - 124

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-748299/1-A
Matrix: Water
Analysis Batch: 748799

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 748299

Analyte	MB MB		LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Aluminum	150	U	200	150	54	ug/L		11/03/22 18:53	1
Cadmium	1.0	U	5.0	1.0	0.44	ug/L		11/03/22 18:53	1
Chromium	4.0	U	10	4.0	1.1	ug/L		11/03/22 18:53	1
Copper	10	U	20	10	3.2	ug/L		11/03/22 18:53	1
Lead	20	U	40	20	6.6	ug/L		11/03/22 18:53	1
Nickel	10	U	40	10	3.3	ug/L		11/03/22 18:53	1
Silver	5.0	U	10	5.0	1.5	ug/L		11/03/22 18:53	1
Zinc	20	U	25	20	8.7	ug/L		11/03/22 18:53	1

Lab Sample ID: LCS 680-748299/2-A
Matrix: Water
Analysis Batch: 748799

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 748299

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Aluminum	5000	4920		ug/L		98	86 - 115
Cadmium	50.0	46.3		ug/L		93	88 - 113
Chromium	100	96.5		ug/L		96	90 - 113
Copper	100	103		ug/L		103	86 - 114
Lead	505	467		ug/L		93	86 - 113
Nickel	99.0	95.0		ug/L		96	88 - 113
Silver	50.0	46.8		ug/L		94	84 - 115
Zinc	100	98.0		ug/L		98	87 - 115

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 680-748301/1-A
 Matrix: Water
 Analysis Batch: 748817

Client Sample ID: Method Blank
 Prep Type: Total Recoverable
 Prep Batch: 748301

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		11/03/22 17:09	1

Lab Sample ID: LCS 680-748301/2-A
 Matrix: Water
 Analysis Batch: 748817

Client Sample ID: Lab Control Sample
 Prep Type: Total Recoverable
 Prep Batch: 748301

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	102		ug/L		102	84 - 116

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 680-748168/1-A
 Matrix: Water
 Analysis Batch: 748336

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 748168

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.20	U	0.25	0.20	0.080	ug/L		11/01/22 23:04	1

Lab Sample ID: LCS 680-748168/2-A
 Matrix: Water
 Analysis Batch: 748336

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 748168

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.50	2.30		ug/L		92	80 - 124

Method: 9012B - Cyanide, Total and/or Amenable

Lab Sample ID: MB 680-749684/12-A
 Matrix: Water
 Analysis Batch: 749845

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 749684

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Cyanide, Total	0.0050	U	0.010	0.0050	0.0025	mg/L		11/09/22 15:58	1

Lab Sample ID: LCS 680-749684/13-A
 Matrix: Water
 Analysis Batch: 749845

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 749684

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	0.0500	0.0518		mg/L		104	83 - 116

Method: 9040C - pH

Lab Sample ID: LCS 680-749317/1
 Matrix: Water
 Analysis Batch: 749317

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.01	7.1		SU		101	63 - 158

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Method: 9065 - Phenolics, Total Recoverable

Lab Sample ID: MB 680-748701/1-A
 Matrix: Water
 Analysis Batch: 748751

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 748701

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Phenolics, Total Recoverable	0.050	U	0.050	0.050	0.025	mg/L		11/03/22 19:38	1

Lab Sample ID: LCS 680-748701/2-A
 Matrix: Water
 Analysis Batch: 748751

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 748701

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Phenolics, Total Recoverable	0.100	0.0987		mg/L		99	75 - 125

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 280-592122/3
 Matrix: Water
 Analysis Batch: 592122

Client Sample ID: Method Blank
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Total Suspended Solids	2.8	U	4.0	2.8	1.1	mg/L		11/02/22 12:03	1

Lab Sample ID: LCS 280-592122/1
 Matrix: Water
 Analysis Batch: 592122

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Suspended Solids	503	474		mg/L		94	79 - 114

Lab Sample ID: LCSD 280-592122/2
 Matrix: Water
 Analysis Batch: 592122

Client Sample ID: Lab Control Sample Dup
 Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Total Suspended Solids	500	422		mg/L		84	79 - 114	12	20

QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

GC/MS VOA

Analysis Batch: 593004

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224348-1	DCL LEACHATE-FAL22	Total/NA	Water	624	
MB 280-593004/7	Method Blank	Total/NA	Water	624	
LCS 280-593004/1002	Lab Control Sample	Total/NA	Water	624	
LCSD 280-593004/4	Lab Control Sample Dup	Total/NA	Water	624	

GC/MS Semi VOA

Prep Batch: 592592

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224348-1	DCL LEACHATE-FAL22	Total/NA	Water	625	
MB 280-592592/1-A	Method Blank	Total/NA	Water	625	
LCS 280-592592/2-A	Lab Control Sample	Total/NA	Water	625	
LCSD 280-592592/3-A	Lab Control Sample Dup	Total/NA	Water	625	

Analysis Batch: 593651

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224348-1	DCL LEACHATE-FAL22	Total/NA	Water	625	592592
MB 280-592592/1-A	Method Blank	Total/NA	Water	625	592592
LCS 280-592592/2-A	Lab Control Sample	Total/NA	Water	625	592592
LCSD 280-592592/3-A	Lab Control Sample Dup	Total/NA	Water	625	592592

GC Semi VOA

Prep Batch: 748736

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224348-1	DCL LEACHATE-FAL22	Total/NA	Water	3510C	
MB 680-748736/1-A	Method Blank	Total/NA	Water	3510C	
LCS 680-748736/2-A	Lab Control Sample	Total/NA	Water	3510C	

Prep Batch: 748754

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224348-1	DCL LEACHATE-FAL22	Total/NA	Water	3510C	
MB 680-748754/1-A	Method Blank	Total/NA	Water	3510C	
LCS 680-748754/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 680-748754/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 748883

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224348-1	DCL LEACHATE-FAL22	Total/NA	Water	8015C DRO	748754
MB 680-748754/1-A	Method Blank	Total/NA	Water	8015C DRO	748754
LCS 680-748754/2-A	Lab Control Sample	Total/NA	Water	8015C DRO	748754
LCSD 680-748754/3-A	Lab Control Sample Dup	Total/NA	Water	8015C DRO	748754

Analysis Batch: 749075

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224348-1	DCL LEACHATE-FAL22	Total/NA	Water	8081B 8082A	748736
MB 680-748736/1-A	Method Blank	Total/NA	Water	8081B 8082A	748736
LCS 680-748736/2-A	Lab Control Sample	Total/NA	Water	8081B 8082A	748736

Eurofins Savannah

QC Association Summary

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Metals

Prep Batch: 748168

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224348-1	DCL LEACHATE-FAL22	Total/NA	Water	7470A	
MB 680-748168/1-A	Method Blank	Total/NA	Water	7470A	
LCS 680-748168/2-A	Lab Control Sample	Total/NA	Water	7470A	

Prep Batch: 748299

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224348-1	DCL LEACHATE-FAL22	Total Recoverable	Water	3005A	
MB 680-748299/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-748299/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 748301

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224348-1	DCL LEACHATE-FAL22	Total Recoverable	Water	3005A	
MB 680-748301/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-748301/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 748336

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224348-1	DCL LEACHATE-FAL22	Total/NA	Water	7470A	748168
MB 680-748168/1-A	Method Blank	Total/NA	Water	7470A	748168
LCS 680-748168/2-A	Lab Control Sample	Total/NA	Water	7470A	748168

Analysis Batch: 748799

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224348-1	DCL LEACHATE-FAL22	Total Recoverable	Water	6010C	748299
MB 680-748299/1-A	Method Blank	Total Recoverable	Water	6010C	748299
LCS 680-748299/2-A	Lab Control Sample	Total Recoverable	Water	6010C	748299

Analysis Batch: 748817

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224348-1	DCL LEACHATE-FAL22	Total Recoverable	Water	6020A	748301
MB 680-748301/1-A	Method Blank	Total Recoverable	Water	6020A	748301
LCS 680-748301/2-A	Lab Control Sample	Total Recoverable	Water	6020A	748301

General Chemistry

Analysis Batch: 592122

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224348-1	DCL LEACHATE-FAL22	Total/NA	Water	SM 2540D	
MB 280-592122/3	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-592122/1	Lab Control Sample	Total/NA	Water	SM 2540D	
LCSD 280-592122/2	Lab Control Sample Dup	Total/NA	Water	SM 2540D	

Prep Batch: 748701

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224348-1	DCL LEACHATE-FAL22	Total/NA	Water	Distill/Phenol	
MB 680-748701/1-A	Method Blank	Total/NA	Water	Distill/Phenol	
LCS 680-748701/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	

QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

General Chemistry

Analysis Batch: 748751

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224348-1	DCL LEACHATE-FAL22	Total/NA	Water	9065	748701
MB 680-748701/1-A	Method Blank	Total/NA	Water	9065	748701
LCS 680-748701/2-A	Lab Control Sample	Total/NA	Water	9065	748701

Analysis Batch: 749317

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224348-1	DCL LEACHATE-FAL22	Total/NA	Water	9040C	
LCS 680-749317/1	Lab Control Sample	Total/NA	Water	9040C	

Prep Batch: 749684

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224348-1	DCL LEACHATE-FAL22	Total/NA	Water	9012B	
MB 680-749684/12-A	Method Blank	Total/NA	Water	9012B	
LCS 680-749684/13-A	Lab Control Sample	Total/NA	Water	9012B	

Analysis Batch: 749845

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224348-1	DCL LEACHATE-FAL22	Total/NA	Water	9012B	749684
MB 680-749684/12-A	Method Blank	Total/NA	Water	9012B	749684
LCS 680-749684/13-A	Lab Control Sample	Total/NA	Water	9012B	749684

Lab Chronicle

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Client Sample ID: DCL LEACHATE-FAL22

Lab Sample ID: 680-224348-1

Date Collected: 10/27/22 12:00

Matrix: Water

Date Received: 10/29/22 09:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	624		1	5 mL	5 mL	593004	11/10/22 15:07	MD	EET DEN
Instrument ID: VMS_X4										
Total/NA	Prep	625			50 mL	1 mL	592592	11/07/22 13:11	KAS	EET DEN
Total/NA	Analysis	625		1	1 mL	1 mL	593651	11/17/22 01:34	NIT	EET DEN
Instrument ID: SMS_1										
Total/NA	Prep	3510C			250 mL	1 mL	748754	11/03/22 22:57	MR	EET SAV
Total/NA	Analysis	8015C DRO		1	1 mL	1 mL	748883	11/05/22 01:17	JCK	EET SAV
Instrument ID: CSGAB1										
Total/NA	Prep	3510C			269.5 mL	1 mL	748736	11/03/22 17:37	MR	EET SAV
Total/NA	Analysis	8081B 8082A		1	1 mL	1 mL	749075	11/05/22 20:24	JCK	EET SAV
Instrument ID: CSGZ										
Total Recoverable	Prep	3005A			50 mL	50 mL	748299	11/02/22 08:35	RR	EET SAV
Total Recoverable	Analysis	6010C		1			748799	11/03/22 19:35	BJB	EET SAV
Instrument ID: ICPH										
Total Recoverable	Prep	3005A			50 mL	250 mL	748301	11/02/22 08:35	RR	EET SAV
Total Recoverable	Analysis	6020A		1			748817	11/03/22 17:42	BWR	EET SAV
Instrument ID: ICPMSD										
Total/NA	Prep	7470A			50 mL	50 mL	748168	11/01/22 14:18	BCB	EET SAV
Total/NA	Analysis	7470A		1			748336	11/02/22 00:26	BCB	EET SAV
Instrument ID: LEEMAN2										
Total/NA	Prep	9012B			6 mL	6 mL	749684	11/09/22 08:17	JAS	EET SAV
Total/NA	Analysis	9012B		1			749845	11/09/22 15:59	JAS	EET SAV
Instrument ID: KONELAB4										
Total/NA	Analysis	9040C		1			749317	11/07/22 12:45	PG	EET SAV
Instrument ID: MANTECH 2										
Total/NA	Prep	Distill/Phenol			6 mL	6 mL	748701	11/03/22 16:42	SM	EET SAV
Total/NA	Analysis	9065		1	6 mL	6 mL	748751	11/03/22 19:51	SM	EET SAV
Instrument ID: KONELAB3										
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	592122	11/02/22 12:03	ASP	EET DEN
Instrument ID: NOEQUIP										

Laboratory References:

EET DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	09-22-24

Laboratory: Eurofins Denver

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	2907.01	11-30-22

- 1
- 2
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Method Summary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-1

Method	Method Description	Protocol	Laboratory
624	Volatile Organic Compounds (GC/MS)	40CFR136A	EET DEN
625	Semivolatile Organic Compounds (GC/MS)	40CFR136A	EET DEN
8015C DRO	Diesel Range Organics (DRO) (GC)	SW846	EET SAV
8081B 8082A	Organochlorine Pesticides & PCBs (GC)	SW846	EET SAV
6010C	Metals (ICP)	SW846	EET SAV
6020A	Metals (ICP/MS)	SW846	EET SAV
7470A	Mercury (CVAA)	SW846	EET SAV
9012B	Cyanide, Total and/or Amenable	EPA	EET SAV
9040C	pH	SW846	EET SAV
9065	Phenolics, Total Recoverable	SW846	EET SAV
SM 2540D	Solids, Total Suspended (TSS)	SM	EET DEN
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET SAV
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	EET SAV
625	Liquid-Liquid Extraction	40CFR136A	EET DEN
7470A	Preparation, Mercury	SW846	EET SAV
9012B	Cyanide, Total and/or Amenable, Distillation	SW846	EET SAV
Distill/Phenol	Distillation, Phenolics	None	EET SAV

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

EPA = US Environmental Protection Agency

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-224348-1

Login Number: 224348

List Source: Eurofins Savannah

List Number: 1

Creator: Sims, Robert D

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-224348-1

Login Number: 224348

List Number: 2

Creator: Naylis, Patrick J

List Source: Eurofins Denver

List Creation: 11/01/22 04:50 PM

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	False	
COC is filled out in ink and legible.	N/A	
COC is filled out with all pertinent information.	N/A	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



 **ANALYTICAL REPORT****PREPARED FOR**

Attn: Heather Levesque
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Generated 2/8/2023 9:14:34 AM

JOB DESCRIPTION

Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

JOB NUMBER

680-224348-2


Eurofins Savannah

Job Notes

The test results in this report meet NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted. Results pertain only to samples listed in this report. This report may not be reproduced, except in full, without the written approval of the laboratory. Questions should be directed to the person who signed this report.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization



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Authorized for release by
Jerry Lanier, Project Manager I
Jerry.Lanier@et.eurofinsus.com
(912)250-0281

Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-2

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-224348-1	DCL LEACHATE-FAL22	Water	10/27/22 12:00	10/29/22 09:45

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Case Narrative

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-2

Job ID: 680-224348-2

Laboratory: Eurofins Savannah

Narrative

**Job Narrative
680-224348-2**

Receipt

The sample was received on 10/29/2022 9:45 AM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 3.4°C

Pesticides/PCBs

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

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Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-2

Client Sample ID: DCL LEACHATE-FAL22

Lab Sample ID: 680-224348-1

Date Collected: 10/27/22 12:00

Matrix: Water

Date Received: 10/29/22 09:45

Method: SW846 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
PCB-1016	0.67	U M	0.93	0.67	0.30	ug/L		11/05/22 20:24	1
PCB-1221	0.67	U	0.93	0.67	0.32	ug/L		11/05/22 20:24	1
PCB-1232	0.67	U	0.93	0.67	0.32	ug/L		11/05/22 20:24	1
PCB-1242	0.67	U M	0.93	0.67	0.32	ug/L		11/05/22 20:24	1
PCB-1248	0.67	U M Q	0.93	0.67	0.32	ug/L		11/05/22 20:24	1
PCB-1254	0.67	U M	0.93	0.67	0.32	ug/L		11/05/22 20:24	1
PCB-1260	0.67	U Q	0.93	0.67	0.32	ug/L		11/05/22 20:24	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	80		14 - 130	11/03/22 17:37	11/05/22 20:24	1
Tetrachloro-m-xylene	73		44 - 124	11/03/22 17:37	11/05/22 20:24	1

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-2

Method: 8081B 8082A - Organochlorine Pesticides & PCBs (GC)

Lab Sample ID: MB 680-748736/1-A
Matrix: Water
Analysis Batch: 749072

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 748736

Analyte	MB MB		LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
PCB-1016	0.72	U	1.0	0.72	0.32	ug/L		11/05/22 17:55	1
PCB-1221	0.72	U	1.0	0.72	0.34	ug/L		11/05/22 17:55	1
PCB-1232	0.72	U	1.0	0.72	0.34	ug/L		11/05/22 17:55	1
PCB-1242	0.72	U	1.0	0.72	0.34	ug/L		11/05/22 17:55	1
PCB-1248	0.72	U	1.0	0.72	0.34	ug/L		11/05/22 17:55	1
PCB-1254	0.72	U	1.0	0.72	0.34	ug/L		11/05/22 17:55	1
PCB-1260	0.72	U	1.0	0.72	0.34	ug/L		11/05/22 17:55	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
DCB Decachlorobiphenyl	83		14 - 130	11/03/22 17:37	11/05/22 17:55	1
Tetrachloro-m-xylene	52		44 - 124	11/03/22 17:37	11/05/22 17:55	1

Lab Sample ID: LCS 680-748736/11-A
Matrix: Water
Analysis Batch: 749072

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 748736

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
PCB-1016	2.40	1.89		ug/L		79	46 - 129
PCB-1260	2.40	2.56		ug/L		106	45 - 134

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
DCB Decachlorobiphenyl	77		14 - 130
Tetrachloro-m-xylene	59		44 - 124

Lab Sample ID: LCSD 680-748736/12-A
Matrix: Water
Analysis Batch: 749072

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 748736

Analyte	Spike Added	LCSD LCSD		Unit	D	%Rec	%Rec Limits	RPD	
		Result	Qualifier					RPD	Limit
PCB-1016	2.40	1.84		ug/L		76	46 - 129	NaN	30
PCB-1260	2.40	2.59		ug/L		108	45 - 134	NaN	30

Surrogate	LCSD LCSD		Limits
	%Recovery	Qualifier	
DCB Decachlorobiphenyl	90		14 - 130
Tetrachloro-m-xylene	59		44 - 124

QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-2

GC Semi VOA

Prep Batch: 748736

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224348-1	DCL LEACHATE-FAL22	Total/NA	Water	3510C	
MB 680-748736/1-A	Method Blank	Total/NA	Water	3510C	
LCS 680-748736/11-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 680-748736/12-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 749072

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224348-1	DCL LEACHATE-FAL22	Total/NA	Water	8081B 8082A	748736
MB 680-748736/1-A	Method Blank	Total/NA	Water	8081B 8082A	748736
LCS 680-748736/11-A	Lab Control Sample	Total/NA	Water	8081B 8082A	748736
LCSD 680-748736/12-A	Lab Control Sample Dup	Total/NA	Water	8081B 8082A	748736

Lab Chronicle

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-2

Client Sample ID: DCL LEACHATE-FAL22

Lab Sample ID: 680-224348-1

Date Collected: 10/27/22 12:00

Matrix: Water

Date Received: 10/29/22 09:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			269.5 mL	1 mL	748736	11/03/22 17:37	MR	EET SAV
Total/NA	Analysis	8081B 8082A		1	1 mL	1 mL	749072	11/05/22 20:24	JCK	EET SAV
Instrument ID: CSGZ										

Laboratory References:

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858



Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-2

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	09-22-24

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Method Summary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, DCL Leach, Fall 2022

Job ID: 680-224348-2

Method	Method Description	Protocol	Laboratory
8081B 8082A	Organochlorine Pesticides & PCBs (GC)	SW846	EET SAV
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	EET SAV

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858



Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-224348-2

Login Number: 224348

List Number: 1

Creator: Sims, Robert D

List Source: Eurofins Savannah

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



 **ANALYTICAL REPORT****PREPARED FOR**

Attn: Heather Levesque
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

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JOB DESCRIPTION

Seres-Arcadis JV, LTM, AOC 43G, Fall 2022

JOB NUMBER

680-224679-1


Eurofins Savannah

Job Notes

The test results in this report meet NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted. Results pertain only to samples listed in this report. This report may not be reproduced, except in full, without the written approval of the laboratory. Questions should be directed to the person who signed this report.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization



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Revision 1

Authorized for release by
Jerry Lanier, Project Manager I
Jerry.Lanier@et.eurofinsus.com
(912)250-0281

Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 43G, Fall 2022

Job ID: 680-224679-1

Qualifiers

GC VOA

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
D	The reported value is from a dilution.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U	Undetected at the Limit of Detection.

General Chemistry

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)

Eurofins Savannah

Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 43G, Fall 2022

Job ID: 680-224679-1

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

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Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 43G, Fall 2022

Job ID: 680-224679-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-224679-1	AAFES-2-FAL22	Water	10/31/22 13:20	11/03/22 11:00
680-224679-2	AAFES-7-FAL22	Water	10/31/22 11:31	11/03/22 11:00
680-224679-3	AOC43G-DUP01-FAL22	Water	10/31/22 10:50	11/03/22 11:00
680-224679-4	XGM-93-02X-FAL22	Water	10/31/22 13:05	11/03/22 11:00
680-224679-5	XGM-94-04X-FAL22	Water	10/31/22 11:05	11/03/22 11:00
680-224679-6	XGM-97-12X-FAL22	Water	10/31/22 10:50	11/03/22 11:00

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Case Narrative

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 43G, Fall 2022

Job ID: 680-224679-1

Job ID: 680-224679-1

Laboratory: Eurofins Savannah

Narrative

**Job Narrative
680-224679-1**

REVISION

The report being provided is a revision of the original report sent on 1/13/2023. The report (revision 1) is being revised due to additional analytes to be reported for MAVPH.

Report revision history

Receipt

The samples were received on 11/3/2022 11:00 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 2.8°C, 2.9°C and 5.2°C

Receipt Exceptions

The following samples were submitted for analysis; however, it was not listed on the Chain-of-Custody (COC): AAFES-2-FAL22 (680-224679-1), AAFES-7-FAL22 (680-224679-2), AOC43G-DUP01-FAL22 (680-224679-3), XGM-93-02X-FAL22 (680-224679-4), XGM-94-04X-FAL22 (680-224679-5), XGM-94-04X-FAL22 (680-224679-5[MS]), XGM-94-04X-FAL22 (680-224679-5[MSD]), XGM-97-12X-FAL22 (680-224679-6) and SHM-13-15-FAL22 (680-224679-7)

Received 6 voa vials 40ml - HCL. 3 marked for MAVPH...and 3 marked for 8260. No 8260 analysis listed on COC.

GC VOA

Method MAVPH2.1: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 620-17232 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method MAVPH2.1: Surrogate recovery for the following samples were outside control limits: AOC43G-DUP01-FAL22 (680-224679-3) and XGM-97-12X-FAL22 (680-224679-6). Evidence of matrix interference is present; sample reanalyzed at a dilution.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry

Method 2320B: The following sample(s) was analyzed outside of analytical holding time due to scheduling error. AAFES-2-FAL22 (680-224679-1), AOC43G-DUP01-FAL22 (680-224679-3), XGM-93-02X-FAL22 (680-224679-4), XGM-94-04X-FAL22 (680-224679-5) and XGM-97-12X-FAL22 (680-224679-6).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 43G, Fall 2022

Job ID: 680-224679-1

Client Sample ID: AAFES-2-FAL22

Lab Sample ID: 680-224679-1

Date Collected: 10/31/22 13:20

Matrix: Water

Date Received: 11/03/22 11:00

Method: MA DEP MAVPH2.1 - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	1.0	U M	5.0	1.0	0.13	ug/L		11/10/22 18:50	1
C5-C8 Aliphatics (adjusted)	610		100	3.0	0.55	ug/L		11/10/22 18:50	1
C9-C10 Aromatics	530		100	1.0	0.85	ug/L		11/10/22 18:50	1
Ethylbenzene	11		5.0	1.0	0.24	ug/L		11/10/22 18:50	1
Methyl tert-butyl ether	1.0	U M	5.0	1.0	0.19	ug/L		11/10/22 18:50	1
m,p-Xylene	1.0	U M	10	1.0	0.42	ug/L		11/10/22 18:50	1
Naphthalene	9.5		5.0	1.0	0.56	ug/L		11/10/22 18:50	1
o-Xylene	1.0	U M	5.0	1.0	0.24	ug/L		11/10/22 18:50	1
Toluene	1.0	U M	5.0	1.0	0.15	ug/L		11/10/22 18:50	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,5-Dibromotoluene (fid)	127		70 - 130					11/10/22 18:50	1
2,5-Dibromotoluene (pid)	119		70 - 130					11/10/22 18:50	1

Method: MA DEP MAVPH2.1 - Massachusetts - Volatile Petroleum Hydrocarbons (GC) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C9-C12 Aliphatics (adjusted)	1100	D	500	15	9.3	ug/L		11/11/22 17:24	5

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	14000		100	50	20	ug/L		11/09/22 21:28	1
Manganese	2600		10	5.0	1.3	ug/L		11/09/22 21:28	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity (SM 2320B-2011)	140	H	5.0	5.0	2.2	mg/L		11/15/22 01:45	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 43G, Fall 2022

Job ID: 680-224679-1

Client Sample ID: AAFES-7-FAL22

Lab Sample ID: 680-224679-2

Date Collected: 10/31/22 11:31

Matrix: Water

Date Received: 11/03/22 11:00

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Manganese	77		10	5.0	1.3	ug/L		11/09/22 21:31	1

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- 2
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Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 43G, Fall 2022

Job ID: 680-224679-1

Client Sample ID: AOC43G-DUP01-FAL22

Lab Sample ID: 680-224679-3

Date Collected: 10/31/22 10:50

Matrix: Water

Date Received: 11/03/22 11:00

Method: MA DEP MAVPH2.1 - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	1.0	U	5.0	1.0	0.13	ug/L		11/10/22 17:34	1
C5-C8 Aliphatics (adjusted)	190		100	3.0	0.55	ug/L		11/10/22 17:34	1
C9-C10 Aromatics	160		100	1.0	0.85	ug/L		11/10/22 17:34	1
Ethylbenzene	1.0	U M	5.0	1.0	0.24	ug/L		11/10/22 17:34	1
Methyl tert-butyl ether	1.0	U	5.0	1.0	0.19	ug/L		11/10/22 17:34	1
m,p-Xylene	1.0	U M	10	1.0	0.42	ug/L		11/10/22 17:34	1
Naphthalene	1.0	U M	5.0	1.0	0.56	ug/L		11/10/22 17:34	1
o-Xylene	1.0	U	5.0	1.0	0.24	ug/L		11/10/22 17:34	1
Toluene	1.0	U M	5.0	1.0	0.15	ug/L		11/10/22 17:34	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,5-Dibromotoluene (fid)	138	Q	70 - 130					11/10/22 17:34	1
2,5-Dibromotoluene (pid)	128	M	70 - 130					11/10/22 17:34	1

Method: MA DEP MAVPH2.1 - Massachusetts - Volatile Petroleum Hydrocarbons (GC) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C9-C12 Aliphatics (adjusted)	350	J D	500	15	9.3	ug/L		11/11/22 18:02	5

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	16000		100	50	20	ug/L		11/09/22 21:34	1
Manganese	1100		10	5.0	1.3	ug/L		11/09/22 21:34	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity (SM 2320B-2011)	180	H	5.0	5.0	2.2	mg/L		11/15/22 00:45	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 43G, Fall 2022

Job ID: 680-224679-1

Client Sample ID: XGM-93-02X-FAL22

Lab Sample ID: 680-224679-4

Date Collected: 10/31/22 13:05

Matrix: Water

Date Received: 11/03/22 11:00

Method: MA DEP MAVPH2.1 - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	1.0	U	5.0	1.0	0.13	ug/L		11/10/22 16:56	1
C5-C8 Aliphatics (adjusted)	110		100	3.0	0.55	ug/L		11/10/22 16:56	1
C9-C12 Aliphatics (adjusted)	89	J	100	3.0	1.9	ug/L		11/10/22 16:56	1
C9-C10 Aromatics	50	J	100	1.0	0.85	ug/L		11/10/22 16:56	1
Ethylbenzene	1.0	U	5.0	1.0	0.24	ug/L		11/10/22 16:56	1
Methyl tert-butyl ether	4.9	J	5.0	1.0	0.19	ug/L		11/10/22 16:56	1
m,p-Xylene	1.0	U	10	1.0	0.42	ug/L		11/10/22 16:56	1
Naphthalene	1.0	UM	5.0	1.0	0.56	ug/L		11/10/22 16:56	1
o-Xylene	1.0	U	5.0	1.0	0.24	ug/L		11/10/22 16:56	1
Toluene	1.0	UM	5.0	1.0	0.15	ug/L		11/10/22 16:56	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,5-Dibromotoluene (fid)	128	M	70 - 130		11/10/22 16:56	1
2,5-Dibromotoluene (pid)	122		70 - 130		11/10/22 16:56	1

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	4400		100	50	20	ug/L		11/09/22 21:38	1
Manganese	1000		10	5.0	1.3	ug/L		11/09/22 21:38	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity (SM 2320B-2011)	180	H	5.0	5.0	2.2	mg/L		11/15/22 01:06	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 43G, Fall 2022

Job ID: 680-224679-1

Client Sample ID: XGM-94-04X-FAL22

Lab Sample ID: 680-224679-5

Date Collected: 10/31/22 11:05

Matrix: Water

Date Received: 11/03/22 11:00

Method: MA DEP MAVPH2.1 - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	1.0	U M	5.0	1.0	0.13	ug/L		11/09/22 18:18	1
C5-C8 Aliphatics (adjusted)	260		100	3.0	0.55	ug/L		11/09/22 18:18	1
C9-C12 Aliphatics (adjusted)	370		100	3.0	1.9	ug/L		11/09/22 18:18	1
C9-C10 Aromatics	190	J1	100	1.0	0.85	ug/L		11/09/22 18:18	1
Ethylbenzene	8.9		5.0	1.0	0.24	ug/L		11/09/22 18:18	1
Methyl tert-butyl ether	1.0	U	5.0	1.0	0.19	ug/L		11/09/22 18:18	1
m,p-Xylene	1.0	U M	10	1.0	0.42	ug/L		11/09/22 18:18	1
Naphthalene	1.0	U M	5.0	1.0	0.56	ug/L		11/09/22 18:18	1
o-Xylene	1.0	U M	5.0	1.0	0.24	ug/L		11/09/22 18:18	1
Toluene	1.0	U M	5.0	1.0	0.15	ug/L		11/09/22 18:18	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,5-Dibromotoluene (fid)	114		70 - 130		11/09/22 18:18	1
2,5-Dibromotoluene (pid)	109		70 - 130		11/09/22 18:18	1

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	4800	J1	100	50	20	ug/L		11/09/22 21:13	1
Manganese	5600	J1	10	5.0	1.3	ug/L		11/09/22 21:13	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity (SM 2320B-2011)	170	H	5.0	5.0	2.2	mg/L		11/15/22 00:55	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 43G, Fall 2022

Job ID: 680-224679-1

Client Sample ID: XGM-97-12X-FAL22

Lab Sample ID: 680-224679-6

Date Collected: 10/31/22 10:50

Matrix: Water

Date Received: 11/03/22 11:00

Method: MA DEP MAVPH2.1 - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	1.0	U	5.0	1.0	0.13	ug/L		11/10/22 18:12	1
C5-C8 Aliphatics (adjusted)	190		100	3.0	0.55	ug/L		11/10/22 18:12	1
C9-C10 Aromatics	160		100	1.0	0.85	ug/L		11/10/22 18:12	1
Ethylbenzene	1.0	U M	5.0	1.0	0.24	ug/L		11/10/22 18:12	1
Methyl tert-butyl ether	1.0	U	5.0	1.0	0.19	ug/L		11/10/22 18:12	1
m,p-Xylene	1.0	U M	10	1.0	0.42	ug/L		11/10/22 18:12	1
Naphthalene	1.0	U M	5.0	1.0	0.56	ug/L		11/10/22 18:12	1
o-Xylene	1.0	U	5.0	1.0	0.24	ug/L		11/10/22 18:12	1
Toluene	1.0	U M	5.0	1.0	0.15	ug/L		11/10/22 18:12	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,5-Dibromotoluene (fid)	134	Q	70 - 130		11/10/22 18:12	1
2,5-Dibromotoluene (pid)	124		70 - 130		11/10/22 18:12	1

Method: MA DEP MAVPH2.1 - Massachusetts - Volatile Petroleum Hydrocarbons (GC) - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C9-C12 Aliphatics (adjusted)	330	J D	500	15	9.3	ug/L		11/11/22 18:41	5

Method: SW846 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	16000		100	50	20	ug/L		11/09/22 21:41	1
Manganese	1100		10	5.0	1.3	ug/L		11/09/22 21:41	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity (SM 2320B-2011)	180	H	5.0	5.0	2.2	mg/L		11/15/22 01:28	1

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 43G, Fall 2022

Job ID: 680-224679-1

Method: MAVPH2.1 - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Lab Sample ID: MB 620-17232/6
Matrix: Water
Analysis Batch: 17232

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB MB		LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Benzene	1.0	U	5.0	1.0	0.13	ug/L		11/09/22 15:07	1
C5-C8 Aliphatics (adjusted)	9.12	J	100	3.0	0.55	ug/L		11/09/22 15:07	1
C9-C12 Aliphatics (adjusted)	2.72	J	100	3.0	1.9	ug/L		11/09/22 15:07	1
C9-C10 Aromatics	10.8	J	100	1.0	0.85	ug/L		11/09/22 15:07	1
Ethylbenzene	1.0	U	5.0	1.0	0.24	ug/L		11/09/22 15:07	1
Methyl tert-butyl ether	1.0	U	5.0	1.0	0.19	ug/L		11/09/22 15:07	1
m,p-Xylene	1.0	U	10	1.0	0.42	ug/L		11/09/22 15:07	1
Naphthalene	1.0	U M	5.0	1.0	0.56	ug/L		11/09/22 15:07	1
o-Xylene	1.0	U	5.0	1.0	0.24	ug/L		11/09/22 15:07	1
Toluene	1.0	U	5.0	1.0	0.15	ug/L		11/09/22 15:07	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
2,5-Dibromotoluene (fid)	117		70 - 130		11/09/22 15:07	1
2,5-Dibromotoluene (pid)	112		70 - 130		11/09/22 15:07	1

Lab Sample ID: LCS 620-17232/3
Matrix: Water
Analysis Batch: 17232

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Benzene	20.0	22.0		ug/L		110	70 - 130
C9-C10 Aromatics	20.0	20.8	J	ug/L		104	70 - 130
Ethylbenzene	20.0	21.6		ug/L		108	70 - 130
Methyl tert-butyl ether	20.0	20.9		ug/L		104	70 - 130
m,p-Xylene	40.0	43.5		ug/L		109	70 - 130
Naphthalene	20.0	15.5		ug/L		78	70 - 130
o-Xylene	20.0	21.8		ug/L		109	70 - 130
Toluene	20.0	22.1		ug/L		110	70 - 130

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
2,5-Dibromotoluene (fid)	98		70 - 130
2,5-Dibromotoluene (pid)	95		70 - 130

Lab Sample ID: LCSD 620-17232/4
Matrix: Water
Analysis Batch: 17232

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD LCSD		Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
		Result	Qualifier						
Benzene	20.0	19.9		ug/L		100	70 - 130	10	25
C9-C10 Aromatics	20.0	19.6	J	ug/L		98	70 - 130	6	25
Ethylbenzene	20.0	20.1		ug/L		100	70 - 130	7	25
Methyl tert-butyl ether	20.0	21.1		ug/L		106	70 - 130	1	25
m,p-Xylene	40.0	40.6		ug/L		101	70 - 130	7	25
Naphthalene	20.0	19.4		ug/L		97	70 - 130	22	25
o-Xylene	20.0	20.3		ug/L		102	70 - 130	7	25
Toluene	20.0	20.0		ug/L		100	70 - 130	10	25

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 43G, Fall 2022

Job ID: 680-224679-1

Method: MAVPH2.1 - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCSD 620-17232/4
Matrix: Water
Analysis Batch: 17232

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

<u>Surrogate</u>	<u>LCSD %Recovery</u>	<u>LCSD Qualifier</u>	<u>Limits</u>
2,5-Dibromotoluene (fid)	123		70 - 130
2,5-Dibromotoluene (pid)	119		70 - 130

Lab Sample ID: 680-224679-5 MS
Matrix: Water
Analysis Batch: 17232

Client Sample ID: XGM-94-04X-FAL22
Prep Type: Total/NA

<u>Analyte</u>	<u>Sample Result</u>	<u>Sample Qualifier</u>	<u>Spike Added</u>	<u>MS Result</u>	<u>MS Qualifier</u>	<u>Unit</u>	<u>D</u>	<u>%Rec</u>	<u>%Rec Limits</u>
Benzene	1.0	U M	20.3	18.7		ug/L		92	70 - 130
C9-C10 Aromatics	190	J1	20.3	282	4	ug/L		475	70 - 130
Ethylbenzene	8.9		20.3	29.1		ug/L		99	70 - 130
Methyl tert-butyl ether	1.0	U	20.3	19.5		ug/L		96	70 - 130
m,p-Xylene	1.0	U M	40.7	36.4		ug/L		89	70 - 130
Naphthalene	1.0	U M	20.3	19.2		ug/L		94	70 - 130
o-Xylene	1.0	U M	20.3	19.2		ug/L		94	70 - 130
Toluene	1.0	U M	20.3	18.0		ug/L		89	70 - 130

<u>Surrogate</u>	<u>MS %Recovery</u>	<u>MS Qualifier</u>	<u>Limits</u>
2,5-Dibromotoluene (fid)	119		70 - 130
2,5-Dibromotoluene (pid)	115		70 - 130

Lab Sample ID: 680-224679-5 MSD
Matrix: Water
Analysis Batch: 17232

Client Sample ID: XGM-94-04X-FAL22
Prep Type: Total/NA

<u>Analyte</u>	<u>Sample Result</u>	<u>Sample Qualifier</u>	<u>Spike Added</u>	<u>MSD Result</u>	<u>MSD Qualifier</u>	<u>Unit</u>	<u>D</u>	<u>%Rec</u>	<u>%Rec Limits</u>	<u>RPD</u>	<u>RPD Limit</u>
Benzene	1.0	U M	20.3	16.5		ug/L		81	70 - 130	13	30
C9-C10 Aromatics	190	J1	20.3	348	4	ug/L		795	70 - 130	21	30
Ethylbenzene	8.9		20.3	29.5		ug/L		101	70 - 130	1	30
Methyl tert-butyl ether	1.0	U	20.3	17.1		ug/L		84	70 - 130	13	30
m,p-Xylene	1.0	U M	40.7	31.3		ug/L		77	70 - 130	15	30
Naphthalene	1.0	U M	20.3	17.9		ug/L		88	70 - 130	7	30
o-Xylene	1.0	U M	20.3	16.6		ug/L		82	70 - 130	14	30
Toluene	1.0	U M	20.3	15.6		ug/L		77	70 - 130	15	30

<u>Surrogate</u>	<u>MSD %Recovery</u>	<u>MSD Qualifier</u>	<u>Limits</u>
2,5-Dibromotoluene (fid)	121		70 - 130
2,5-Dibromotoluene (pid)	117		70 - 130

Lab Sample ID: MB 620-17291/6
Matrix: Water
Analysis Batch: 17291

Client Sample ID: Method Blank
Prep Type: Total/NA

<u>Analyte</u>	<u>MB Result</u>	<u>MB Qualifier</u>	<u>LOQ</u>	<u>LOD</u>	<u>DL</u>	<u>Unit</u>	<u>D</u>	<u>Analyzed</u>	<u>Dil Fac</u>
Benzene	1.0	U	5.0	1.0	0.13	ug/L		11/10/22 13:46	1
C5-C8 Aliphatics (adjusted)	8.68	J	100	3.0	0.55	ug/L		11/10/22 13:46	1
C9-C12 Aliphatics (adjusted)	3.37	J	100	3.0	1.9	ug/L		11/10/22 13:46	1
C9-C10 Aromatics	10.3	J	100	1.0	0.85	ug/L		11/10/22 13:46	1

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 43G, Fall 2022

Job ID: 680-224679-1

Method: MAVPH2.1 - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: MB 620-17291/6
Matrix: Water
Analysis Batch: 17291

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB MB		LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Ethylbenzene	1.0	U	5.0	1.0	0.24	ug/L		11/10/22 13:46	1
Methyl tert-butyl ether	1.0	U	5.0	1.0	0.19	ug/L		11/10/22 13:46	1
m,p-Xylene	1.0	U	10	1.0	0.42	ug/L		11/10/22 13:46	1
Naphthalene	1.0	U M	5.0	1.0	0.56	ug/L		11/10/22 13:46	1
o-Xylene	1.0	U	5.0	1.0	0.24	ug/L		11/10/22 13:46	1
Toluene	1.0	U	5.0	1.0	0.15	ug/L		11/10/22 13:46	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
2,5-Dibromotoluene (fid)	113		70 - 130		11/10/22 13:46	1
2,5-Dibromotoluene (pid)	106		70 - 130		11/10/22 13:46	1

Lab Sample ID: LCS 620-17291/3
Matrix: Water
Analysis Batch: 17291

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Benzene	20.0	20.2		ug/L		101	70 - 130
C9-C10 Aromatics	20.0	19.5	J	ug/L		97	70 - 130
Ethylbenzene	20.0	20.2		ug/L		101	70 - 130
Methyl tert-butyl ether	20.0	20.9		ug/L		104	70 - 130
m,p-Xylene	40.0	40.3		ug/L		101	70 - 130
Naphthalene	20.0	19.4		ug/L		97	70 - 130
o-Xylene	20.0	20.5		ug/L		102	70 - 130
Toluene	20.0	20.2		ug/L		101	70 - 130

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
2,5-Dibromotoluene (fid)	112		70 - 130
2,5-Dibromotoluene (pid)	107		70 - 130

Lab Sample ID: LCSD 620-17291/4
Matrix: Water
Analysis Batch: 17291

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD LCSD		Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
		Result	Qualifier						
Benzene	20.0	19.5		ug/L		97	70 - 130	4	25
C9-C10 Aromatics	20.0	18.9	J	ug/L		95	70 - 130	3	25
Ethylbenzene	20.0	19.5		ug/L		97	70 - 130	3	25
Methyl tert-butyl ether	20.0	20.8		ug/L		104	70 - 130	0	25
m,p-Xylene	40.0	39.0		ug/L		98	70 - 130	3	25
Naphthalene	20.0	18.6		ug/L		93	70 - 130	4	25
o-Xylene	20.0	19.8		ug/L		99	70 - 130	3	25
Toluene	20.0	19.6		ug/L		98	70 - 130	3	25

Surrogate	LCSD LCSD		Limits
	%Recovery	Qualifier	
2,5-Dibromotoluene (fid)	120		70 - 130
2,5-Dibromotoluene (pid)	114		70 - 130

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 43G, Fall 2022

Job ID: 680-224679-1

Method: MAVPH2.1 - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: MB 620-17338/6
Matrix: Water
Analysis Batch: 17338

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB MB		LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Benzene	1.0	U	5.0	1.0	0.13	ug/L		11/11/22 12:58	1
C5-C8 Aliphatics (adjusted)	9.21	J	100	3.0	0.55	ug/L		11/11/22 12:58	1
C9-C12 Aliphatics (adjusted)	2.89	J	100	3.0	1.9	ug/L		11/11/22 12:58	1
C9-C10 Aromatics	11.9	J	100	1.0	0.85	ug/L		11/11/22 12:58	1
Ethylbenzene	1.0	U	5.0	1.0	0.24	ug/L		11/11/22 12:58	1
Methyl tert-butyl ether	1.0	U	5.0	1.0	0.19	ug/L		11/11/22 12:58	1
m,p-Xylene	1.0	U	10	1.0	0.42	ug/L		11/11/22 12:58	1
Naphthalene	1.0	U M	5.0	1.0	0.56	ug/L		11/11/22 12:58	1
o-Xylene	1.0	U	5.0	1.0	0.24	ug/L		11/11/22 12:58	1
Toluene	1.0	U	5.0	1.0	0.15	ug/L		11/11/22 12:58	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
2,5-Dibromotoluene (fid)	116		70 - 130		11/11/22 12:58	1
2,5-Dibromotoluene (pid)	110		70 - 130		11/11/22 12:58	1

Lab Sample ID: LCS 620-17338/3
Matrix: Water
Analysis Batch: 17338

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Benzene	20.0	21.2		ug/L		106	70 - 130
C9-C10 Aromatics	20.0	20.1	J	ug/L		101	70 - 130
Ethylbenzene	20.0	20.9		ug/L		104	70 - 130
Methyl tert-butyl ether	20.0	22.3		ug/L		111	70 - 130
m,p-Xylene	40.0	41.9		ug/L		105	70 - 130
Naphthalene	20.0	17.9		ug/L		90	70 - 130
o-Xylene	20.0	21.2		ug/L		106	70 - 130
Toluene	20.0	21.4		ug/L		107	70 - 130

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
2,5-Dibromotoluene (fid)	105		70 - 130
2,5-Dibromotoluene (pid)	99		70 - 130

Lab Sample ID: LCSD 620-17338/4
Matrix: Water
Analysis Batch: 17338

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD LCSD		Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
		Result	Qualifier						
Benzene	20.0	19.7		ug/L		99	70 - 130	7	25
C9-C10 Aromatics	20.0	19.3	J	ug/L		96	70 - 130	4	25
Ethylbenzene	20.0	19.6		ug/L		98	70 - 130	6	25
Methyl tert-butyl ether	20.0	21.0		ug/L		105	70 - 130	6	25
m,p-Xylene	40.0	39.8		ug/L		100	70 - 130	5	25
Naphthalene	20.0	20.2		ug/L		101	70 - 130	12	25
o-Xylene	20.0	20.1		ug/L		100	70 - 130	5	25
Toluene	20.0	19.7		ug/L		98	70 - 130	8	25

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 43G, Fall 2022

Job ID: 680-224679-1

Method: MAVPH2.1 - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCSD 620-17338/4
 Matrix: Water
 Analysis Batch: 17338

Client Sample ID: Lab Control Sample Dup
 Prep Type: Total/NA

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
2,5-Dibromotoluene (fid)	128		70 - 130
2,5-Dibromotoluene (pid)	120		70 - 130

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-748987/1-A
 Matrix: Water
 Analysis Batch: 749946

Client Sample ID: Method Blank
 Prep Type: Total Recoverable
 Prep Batch: 748987

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	50	U	100	50	20	ug/L		11/09/22 21:01	1
Manganese	5.0	U	10	5.0	1.3	ug/L		11/09/22 21:01	1

Lab Sample ID: LCS 680-748987/2-A
 Matrix: Water
 Analysis Batch: 749946

Client Sample ID: Lab Control Sample
 Prep Type: Total Recoverable
 Prep Batch: 748987

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	5000	4850		ug/L		97	87 - 115
Manganese	400	415		ug/L		104	90 - 114

Lab Sample ID: 680-224679-5 MS
 Matrix: Water
 Analysis Batch: 749946

Client Sample ID: XGM-94-04X-FAL22
 Prep Type: Total Recoverable
 Prep Batch: 748987

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	4800	J1	5000	9370		ug/L		91	87 - 115
Manganese	5600	J1	400	5650	4	ug/L		25	90 - 114

Lab Sample ID: 680-224679-5 MSD
 Matrix: Water
 Analysis Batch: 749946

Client Sample ID: XGM-94-04X-FAL22
 Prep Type: Total Recoverable
 Prep Batch: 748987

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Iron	4800	J1	5000	9020	J1	ug/L		84	87 - 115	4	20
Manganese	5600	J1	400	5040	4	ug/L		-129	90 - 114	11	20

Method: 2320B-2011 - Alkalinity, Total

Lab Sample ID: MB 680-750717/4
 Matrix: Water
 Analysis Batch: 750717

Client Sample ID: Method Blank
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Alkalinity	5.0	U	5.0	5.0	2.2	mg/L		11/14/22 23:51	1

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 43G, Fall 2022

Job ID: 680-224679-1

Method: 2320B-2011 - Alkalinity, Total (Continued)

Lab Sample ID: LCS 680-750717/6
Matrix: Water
Analysis Batch: 750717

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Alkalinity	250	244		mg/L		98	90 - 112

Lab Sample ID: LCSD 680-750717/31
Matrix: Water
Analysis Batch: 750717

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Alkalinity	250	246		mg/L		98	90 - 112	1	30



QC Association Summary

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 43G, Fall 2022

Job ID: 680-224679-1

GC VOA

Analysis Batch: 17232

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224679-5	XGM-94-04X-FAL22	Total/NA	Water	MAVPH2.1	
MB 620-17232/6	Method Blank	Total/NA	Water	MAVPH2.1	
LCS 620-17232/3	Lab Control Sample	Total/NA	Water	MAVPH2.1	
LCSD 620-17232/4	Lab Control Sample Dup	Total/NA	Water	MAVPH2.1	
680-224679-5 MS	XGM-94-04X-FAL22	Total/NA	Water	MAVPH2.1	
680-224679-5 MSD	XGM-94-04X-FAL22	Total/NA	Water	MAVPH2.1	

Analysis Batch: 17291

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224679-1	AAFES-2-FAL22	Total/NA	Water	MAVPH2.1	
680-224679-3	AOC43G-DUP01-FAL22	Total/NA	Water	MAVPH2.1	
680-224679-4	XGM-93-02X-FAL22	Total/NA	Water	MAVPH2.1	
680-224679-6	XGM-97-12X-FAL22	Total/NA	Water	MAVPH2.1	
MB 620-17291/6	Method Blank	Total/NA	Water	MAVPH2.1	
LCS 620-17291/3	Lab Control Sample	Total/NA	Water	MAVPH2.1	
LCSD 620-17291/4	Lab Control Sample Dup	Total/NA	Water	MAVPH2.1	

Analysis Batch: 17338

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224679-1 - DL	AAFES-2-FAL22	Total/NA	Water	MAVPH2.1	
680-224679-3 - DL	AOC43G-DUP01-FAL22	Total/NA	Water	MAVPH2.1	
680-224679-6 - DL	XGM-97-12X-FAL22	Total/NA	Water	MAVPH2.1	
MB 620-17338/6	Method Blank	Total/NA	Water	MAVPH2.1	
LCS 620-17338/3	Lab Control Sample	Total/NA	Water	MAVPH2.1	
LCSD 620-17338/4	Lab Control Sample Dup	Total/NA	Water	MAVPH2.1	

Metals

Prep Batch: 748987

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224679-1	AAFES-2-FAL22	Total Recoverable	Water	3005A	
680-224679-2	AAFES-7-FAL22	Total Recoverable	Water	3005A	
680-224679-3	AOC43G-DUP01-FAL22	Total Recoverable	Water	3005A	
680-224679-4	XGM-93-02X-FAL22	Total Recoverable	Water	3005A	
680-224679-5	XGM-94-04X-FAL22	Total Recoverable	Water	3005A	
680-224679-6	XGM-97-12X-FAL22	Total Recoverable	Water	3005A	
MB 680-748987/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-748987/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-224679-5 MS	XGM-94-04X-FAL22	Total Recoverable	Water	3005A	
680-224679-5 MSD	XGM-94-04X-FAL22	Total Recoverable	Water	3005A	

Analysis Batch: 749946

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224679-1	AAFES-2-FAL22	Total Recoverable	Water	6010C	748987
680-224679-2	AAFES-7-FAL22	Total Recoverable	Water	6010C	748987
680-224679-3	AOC43G-DUP01-FAL22	Total Recoverable	Water	6010C	748987
680-224679-4	XGM-93-02X-FAL22	Total Recoverable	Water	6010C	748987
680-224679-5	XGM-94-04X-FAL22	Total Recoverable	Water	6010C	748987
680-224679-6	XGM-97-12X-FAL22	Total Recoverable	Water	6010C	748987
MB 680-748987/1-A	Method Blank	Total Recoverable	Water	6010C	748987
LCS 680-748987/2-A	Lab Control Sample	Total Recoverable	Water	6010C	748987

Eurofins Savannah

QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 43G, Fall 2022

Job ID: 680-224679-1

Metals (Continued)

Analysis Batch: 749946 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224679-5 MS	XGM-94-04X-FAL22	Total Recoverable	Water	6010C	748987
680-224679-5 MSD	XGM-94-04X-FAL22	Total Recoverable	Water	6010C	748987

General Chemistry

Analysis Batch: 750717

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224679-1	AAFES-2-FAL22	Total/NA	Water	2320B-2011	
680-224679-3	AOC43G-DUP01-FAL22	Total/NA	Water	2320B-2011	
680-224679-4	XGM-93-02X-FAL22	Total/NA	Water	2320B-2011	
680-224679-5	XGM-94-04X-FAL22	Total/NA	Water	2320B-2011	
680-224679-6	XGM-97-12X-FAL22	Total/NA	Water	2320B-2011	
MB 680-750717/4	Method Blank	Total/NA	Water	2320B-2011	
LCS 680-750717/6	Lab Control Sample	Total/NA	Water	2320B-2011	
LCSD 680-750717/31	Lab Control Sample Dup	Total/NA	Water	2320B-2011	

Lab Chronicle

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 43G, Fall 2022

Job ID: 680-224679-1

Client Sample ID: AAFES-2-FAL22

Lab Sample ID: 680-224679-1

Date Collected: 10/31/22 13:20

Matrix: Water

Date Received: 11/03/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	MAVPH2.1		1	1 mL	1 mL	17291	11/10/22 18:50	BMH	EET NE
Instrument ID: FID1										
Total/NA	Analysis	MAVPH2.1	DL	5	1 mL	1 mL	17338	11/11/22 17:24	BMH	EET NE
Instrument ID: FID1										
Total Recoverable	Prep	3005A			50 mL	50 mL	748987	11/05/22 08:45	BCB	EET SAV
Total Recoverable	Analysis	6010C		1			749946	11/09/22 21:28	BJB	EET SAV
Instrument ID: ICPH										
Total/NA	Analysis	2320B-2011		1			750717	11/15/22 01:45	PG	EET SAV
Instrument ID: MANTECH 2										

Client Sample ID: AAFES-7-FAL22

Lab Sample ID: 680-224679-2

Date Collected: 10/31/22 11:31

Matrix: Water

Date Received: 11/03/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	748987	11/05/22 08:45	BCB	EET SAV
Total Recoverable	Analysis	6010C		1			749946	11/09/22 21:31	BJB	EET SAV
Instrument ID: ICPH										

Client Sample ID: AOC43G-DUP01-FAL22

Lab Sample ID: 680-224679-3

Date Collected: 10/31/22 10:50

Matrix: Water

Date Received: 11/03/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	MAVPH2.1		1	1 mL	1 mL	17291	11/10/22 17:34	BMH	EET NE
Instrument ID: FID1										
Total/NA	Analysis	MAVPH2.1	DL	5	1 mL	1 mL	17338	11/11/22 18:02	BMH	EET NE
Instrument ID: FID1										
Total Recoverable	Prep	3005A			50 mL	50 mL	748987	11/05/22 08:45	BCB	EET SAV
Total Recoverable	Analysis	6010C		1			749946	11/09/22 21:34	BJB	EET SAV
Instrument ID: ICPH										
Total/NA	Analysis	2320B-2011		1			750717	11/15/22 00:45	PG	EET SAV
Instrument ID: MANTECH 2										

Client Sample ID: XGM-93-02X-FAL22

Lab Sample ID: 680-224679-4

Date Collected: 10/31/22 13:05

Matrix: Water

Date Received: 11/03/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	MAVPH2.1		1	1 mL	1 mL	17291	11/10/22 16:56	BMH	EET NE
Instrument ID: FID1										
Total Recoverable	Prep	3005A			50 mL	50 mL	748987	11/05/22 08:45	BCB	EET SAV
Total Recoverable	Analysis	6010C		1			749946	11/09/22 21:38	BJB	EET SAV
Instrument ID: ICPH										
Total/NA	Analysis	2320B-2011		1			750717	11/15/22 01:06	PG	EET SAV
Instrument ID: MANTECH 2										

Eurofins Savannah

Lab Chronicle

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 43G, Fall 2022

Job ID: 680-224679-1

Client Sample ID: XGM-94-04X-FAL22

Lab Sample ID: 680-224679-5

Date Collected: 10/31/22 11:05

Matrix: Water

Date Received: 11/03/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	MAVPH2.1		1	1 mL	1 mL	17232	11/09/22 18:18	BMH	EET NE
Instrument ID: FID1										
Total Recoverable	Prep	3005A			50 mL	50 mL	748987	11/05/22 08:45	BCB	EET SAV
Total Recoverable	Analysis	6010C		1			749946	11/09/22 21:13	BJB	EET SAV
Instrument ID: ICPH										
Total/NA	Analysis	2320B-2011		1			750717	11/15/22 00:55	PG	EET SAV
Instrument ID: MANTECH 2										

Client Sample ID: XGM-97-12X-FAL22

Lab Sample ID: 680-224679-6

Date Collected: 10/31/22 10:50

Matrix: Water

Date Received: 11/03/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	MAVPH2.1		1	1 mL	1 mL	17291	11/10/22 18:12	BMH	EET NE
Instrument ID: FID1										
Total/NA	Analysis	MAVPH2.1	DL	5	1 mL	1 mL	17338	11/11/22 18:41	BMH	EET NE
Instrument ID: FID1										
Total Recoverable	Prep	3005A			50 mL	50 mL	748987	11/05/22 08:45	BCB	EET SAV
Total Recoverable	Analysis	6010C		1			749946	11/09/22 21:41	BJB	EET SAV
Instrument ID: ICPH										
Total/NA	Analysis	2320B-2011		1			750717	11/15/22 01:28	PG	EET SAV
Instrument ID: MANTECH 2										

Laboratory References:

EET NE = Eurofins New England, 646 Camp Ave, North Kingstown, RI 02852, TEL (413)789-9018
 EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 43G, Fall 2022

Job ID: 680-224679-1

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	09-22-24

Laboratory: Eurofins New England

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	<cert No.>	02-28-23
Connecticut	State	PH-0722	07-01-23
Maine	State	RI00100	04-17-23
Massachusetts	State	M-RI907	06-30-23
New Hampshire	NELAP	2240	08-03-23
New Jersey	NELAP	RI008	06-30-23
New York	NELAP	11393	04-01-23
Rhode Island	State	LAI00368	12-30-22
USDA	US Federal Programs	P330-20-00109	04-15-23

Method Summary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 43G, Fall 2022

Job ID: 680-224679-1

Method	Method Description	Protocol	Laboratory
MAVPH2.1	Massachusetts - Volatile Petroleum Hydrocarbons (GC)	MA DEP	EET NE
6010C	Metals (ICP)	SW846	EET SAV
2320B-2011	Alkalinity, Total	SM	EET SAV
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET SAV
5030C	Purge and Trap	SW846	EET NE

Protocol References:

MA DEP = Massachusetts Department Of Environmental Protection

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET NE = Eurofins New England, 646 Camp Ave, North Kingstown, RI 02852, TEL (413)789-9018

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
 Nathan Mullens
 669 Marina Drive, Suite B7, Charleston, SC 29492
 (843) 478 0336, jennifer.singer@arcadis.com

COC # AOC43G_FAL22

**Boston
 #215**

Project Name: Former Fort Devens, Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA	Event: Seres-Arcadis JV, Long Term Monitoring, AOC 43G, Fall 2022
Project Number: 30130800	POC: Jerry Lanier, 912-250-0281, jerry.lanier@eurofins.com	
WBS Code:	Ship to: Eurofins TestAmerica, 5102 LaRoche Avenue Savannah GA 31404	

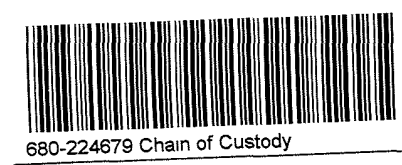
Comments: A2320B (A) = Alkalinity MADEPVP (A) = VPH with targets	Analytical Test Method	A2320B (A)	MADEPVP (A)	ISW6010C - Fe Mn	ISW6010C - Mn														Code Matrix	WG Ground Water	
																			Code Container/Preservative	4 3x 40mL glass VOA Vials, HCl, pH < 2; Cool < 6degC	
Equipment:																					

Event: Seres-Arcadis JV, Long Term Monitoring, AOC 43G, Fall 2022

Sample ID	Matrix	Date	Time	Samp Init.											Location ID	Sample Type	Depth (ft bgs)		Cooler	Comments
																	Top	Bottom		
1	AAFES-2-FAL22	WG	10-31-22	1320	GS	X	X	X							AAFES-2	N1	16.20	31.20	1	
2	AAFES-7-FAL22	WG	10-31-22	1131	SG				X						AAFES-7	N1	4.50	14.50	1	
3	AOC43G-DUP01-FAL22	WG	10-31-22	1050	DC	X	X	X							XGM-97-12X	FD1	24.00	34.00	1	
4	XGM-93-02X-FAL22	WG	10-31-22	1305	DC	X	X	X							XGM-93-02X	N1	28.00	38.00	1	
5	XGM-94-04X-FAL22	WG	10-31-22	1105	GS	X	X	X							XGM-94-04X	N1	18.20	28.20	1	ms/msd
6	XGM-97-12X-FAL22	WG	10-31-22	1050	DC	X	X	X							XGM-97-12X	N1	24.00	34.00	1	
7																				
8																				
9																				
10																				
11																				

Turnaround Time: Standard

MS at 1120
 MSD at 1130



Paul 11/2/22

Relinquished by: (Signature)
 Date
 Time
 Received by: (Signature)

Drane Chips
 11-2-22
 1540

Received by Laboratory: (Signature)
 Date
 Time

DR 11-3-22 1100
 5.2/5.2 2.9/2.9 2.8/2.8



Environment Testing
TestAmerica

Part # 159469-434 MTW EXP 01/23 ••

ORIGIN ID:SAVA (912) 354-7858
SHIPPING
EUROFINS SAVANNAH
5102 LAROCHE AVE

SHIP DATE: 04NOV22
ACTWGT: 15.00 LB MAN
CAD: 0148389/CAFE3616

SAVANNAH, GA 31404
UNITED STATES US

BILL SENDER

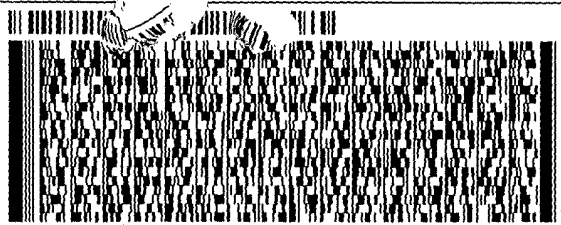
TO SHIPPING/RECEIVING
EUROFINS ENVIRONMENT TESTING NORTHE
646 CAMP AVE

5776C/L/03K/437A

NORTH KINGSTOWN RI 02852

(413) 780-9018
PO YES

REF 8680-140496



FedEx
Express



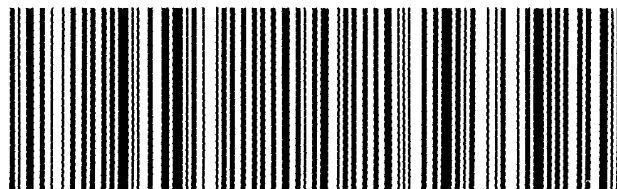
J222022032801 0V

SATURDAY 12:00P
PRIORITY OVERNIGHT

TRK# 1864 9070 7090
0201

XO NCOA

02852
RI-US PVD



- 1
- 2
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- 11
- 12

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-224679-1

Login Number: 224679

List Source: Eurofins Savannah

List Number: 1

Creator: Sims, Robert D

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-224679-1

Login Number: 224679

List Number: 2

Creator: Scott, Krishnan F

List Source: Eurofins New England

List Creation: 11/07/22 06:16 PM

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

 **ANALYTICAL REPORT****PREPARED FOR**

Attn: Heather Levesque
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Generated 1/17/2023 5:11:33 PM Revision 1

JOB DESCRIPTION

Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

JOB NUMBER

680-224673-1


Eurofins Savannah

Job Notes

The test results in this report meet NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted. Results pertain only to samples listed in this report. This report may not be reproduced, except in full, without the written approval of the laboratory. Questions should be directed to the person who signed this report.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization



Generated
1/17/2023 5:11:33 PM
Revision 1

Authorized for release by
Jerry Lanier, Project Manager I
Jerry.Lanier@et.eurofinsus.com
(912)250-0281

Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224673-1

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
B	Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

Metals

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224673-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-224673-1	69W-94-13-FAL22	Water	11/01/22 10:55	11/03/22 11:00
680-224673-2	69W-94-14-FAL22	Water	11/01/22 11:05	11/03/22 11:00
680-224673-3	69WP-08-01-FAL22	Water	11/01/22 13:57	11/03/22 11:00
680-224673-4	69WP-13-01-FAL22	Water	11/01/22 12:17	11/03/22 11:00
680-224673-5	AOC69W-DUP01-FAL22	Water	11/01/22 08:45	11/03/22 11:00
680-224673-6	ZWM-01-25X-FAL22	Water	11/01/22 15:06	11/03/22 11:00
680-224673-7	ZWM-95-15X-FAL22	Water	11/01/22 12:35	11/03/22 11:00
680-224673-8	ZWM-99-22X-FAL22	Water	11/01/22 08:45	11/03/22 11:00
680-224673-9	ZWM-99-23X-FAL22	Water	11/01/22 14:35	11/03/22 11:00
680-224673-10	ZWM-99-24X-FAL22	Water	11/01/22 14:05	11/03/22 11:00

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Case Narrative

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224673-1

Job ID: 680-224673-1

Laboratory: Eurofins Savannah

Narrative

**Job Narrative
680-224673-1**

REVISION

The report being provided is a revision of the original report sent on 11/27/2022. The report (revision 1) is being revised due to C11,C22 Aromatics compound being removed.

Report revision history

Receipt

The samples were received on 11/3/2022 11:00 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 2.8°C, 2.9°C and 5.2°C

GC Semi VOA

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224673-1

Client Sample ID: 69W-94-13-FAL22

Lab Sample ID: 680-224673-1

Date Collected: 11/01/22 10:55

Matrix: Water

Date Received: 11/03/22 11:00

Method: MA DEP MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acenaphthene	1.4	U M	4.8	1.4	0.38	ug/L		11/11/22 16:48	1
Acenaphthylene	1.4	U M	4.8	1.4	0.41	ug/L		11/11/22 16:48	1
Anthracene	1.4	U M	4.8	1.4	0.91	ug/L		11/11/22 16:48	1
Benzo[a]anthracene	3.8	U M	4.8	3.8	1.9	ug/L		11/11/22 16:48	1
Benzo[a]pyrene	4.8	U M	4.8	4.8	2.1	ug/L		11/11/22 16:48	1
Benzo[b]fluoranthene	3.8	U M	4.8	3.8	2.0	ug/L		11/11/22 16:48	1
Benzo[g,h,i]perylene	4.8	U M	4.8	4.8	2.3	ug/L		11/11/22 16:48	1
Benzo[k]fluoranthene	3.8	U M	4.8	3.8	1.7	ug/L		11/11/22 16:48	1
C9-C18 Aliphatics	29	U M	95	29	28	ug/L		11/11/22 16:48	1
C19-C36 Aliphatics	36	J M B	95	30	14	ug/L		11/11/22 16:48	1
C11-C22 Aromatics (Adjusted)	61	J B	95	65	53	ug/L		11/11/22 16:48	1
Chrysene	3.8	U M	4.8	3.8	1.6	ug/L		11/11/22 16:48	1
Dibenz(a,h)anthracene	4.8	U M	4.8	4.8	2.5	ug/L		11/11/22 16:48	1
Fluoranthene	3.8	U M	4.8	3.8	1.1	ug/L		11/11/22 16:48	1
Fluorene	1.4	U M	4.8	1.4	0.60	ug/L		11/11/22 16:48	1
Indeno[1,2,3-cd]pyrene	4.8	U M	4.8	4.8	2.4	ug/L		11/11/22 16:48	1
2-Methylnaphthalene	1.4	U M	4.8	1.4	0.45	ug/L		11/11/22 16:48	1
Naphthalene	1.4	U M	4.8	1.4	0.47	ug/L		11/11/22 16:48	1
Phenanthrene	1.4	U M	4.8	1.4	0.80	ug/L		11/11/22 16:48	1
Pyrene	3.8	U M	4.8	3.8	1.0	ug/L		11/11/22 16:48	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1-Chlorooctadecane (Surr)	48		40 - 140	11/10/22 13:17	11/11/22 16:48	1
o-Terphenyl (Surr)	67		40 - 140	11/10/22 13:17	11/11/22 16:48	1
2-Fluorobiphenyl (Surr)	101		40 - 140	11/10/22 13:17	11/11/22 16:48	1

Method: SW846 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	950		100	50	20	ug/L		11/09/22 21:53	1
Manganese	590		10	5.0	1.3	ug/L		11/09/22 21:53	1

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	15		5.0	3.0	0.86	ug/L		11/08/22 19:34	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224673-1

Client Sample ID: 69W-94-14-FAL22

Lab Sample ID: 680-224673-2

Date Collected: 11/01/22 11:05

Matrix: Water

Date Received: 11/03/22 11:00

Method: MA DEP MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acenaphthene	1.4	U M	4.8	1.4	0.38	ug/L		11/11/22 17:18	1
Acenaphthylene	1.4	U M	4.8	1.4	0.41	ug/L		11/11/22 17:18	1
Anthracene	1.4	U M	4.8	1.4	0.91	ug/L		11/11/22 17:18	1
Benzo[a]anthracene	3.8	U M	4.8	3.8	1.9	ug/L		11/11/22 17:18	1
Benzo[a]pyrene	4.8	U M	4.8	4.8	2.1	ug/L		11/11/22 17:18	1
Benzo[b]fluoranthene	3.8	U M	4.8	3.8	2.0	ug/L		11/11/22 17:18	1
Benzo[g,h,i]perylene	4.8	U M	4.8	4.8	2.3	ug/L		11/11/22 17:18	1
Benzo[k]fluoranthene	3.8	U M	4.8	3.8	1.7	ug/L		11/11/22 17:18	1
C9-C18 Aliphatics	29	U	95	29	28	ug/L		11/11/22 17:18	1
C19-C36 Aliphatics	34	J M B	95	30	14	ug/L		11/11/22 17:18	1
C11-C22 Aromatics (Adjusted)	65	U	95	65	53	ug/L		11/11/22 17:18	1
Chrysene	3.8	U M	4.8	3.8	1.6	ug/L		11/11/22 17:18	1
Dibenz(a,h)anthracene	4.8	U M	4.8	4.8	2.5	ug/L		11/11/22 17:18	1
Fluoranthene	3.8	U M	4.8	3.8	1.1	ug/L		11/11/22 17:18	1
Fluorene	1.4	U M	4.8	1.4	0.60	ug/L		11/11/22 17:18	1
Indeno[1,2,3-cd]pyrene	4.8	U M	4.8	4.8	2.4	ug/L		11/11/22 17:18	1
2-Methylnaphthalene	1.4	U M	4.8	1.4	0.45	ug/L		11/11/22 17:18	1
Naphthalene	1.4	U M	4.8	1.4	0.47	ug/L		11/11/22 17:18	1
Phenanthrene	1.4	U M	4.8	1.4	0.80	ug/L		11/11/22 17:18	1
Pyrene	3.8	U M	4.8	3.8	1.0	ug/L		11/11/22 17:18	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1-Chlorooctadecane (Surr)	55		40 - 140	11/10/22 13:17	11/11/22 17:18	1
o-Terphenyl (Surr)	61		40 - 140	11/10/22 13:17	11/11/22 17:18	1
2-Fluorobiphenyl (Surr)	97		40 - 140	11/10/22 13:17	11/11/22 17:18	1

Method: SW846 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	39	J	100	50	20	ug/L		11/09/22 21:56	1
Manganese	27		10	5.0	1.3	ug/L		11/09/22 21:56	1

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		11/08/22 19:42	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224673-1

Client Sample ID: 69WP-08-01-FAL22

Lab Sample ID: 680-224673-3

Date Collected: 11/01/22 13:57

Matrix: Water

Date Received: 11/03/22 11:00

Method: SW846 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	19000		100	50	20	ug/L		11/09/22 21:59	1
Manganese	1400		10	5.0	1.3	ug/L		11/09/22 21:59	1

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	1.1	J	5.0	3.0	0.86	ug/L		11/08/22 19:45	1

Client Sample Results

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224673-1

Client Sample ID: 69WP-13-01-FAL22

Lab Sample ID: 680-224673-4

Date Collected: 11/01/22 12:17

Matrix: Water

Date Received: 11/03/22 11:00

Method: SW846 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Manganese	990		10	5.0	1.3	ug/L		11/09/22 22:02	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224673-1

Client Sample ID: AOC69W-DUP01-FAL22

Lab Sample ID: 680-224673-5

Date Collected: 11/01/22 08:45

Matrix: Water

Date Received: 11/03/22 11:00

Method: MA DEP MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acenaphthene	1.5	U M	5.0	1.5	0.40	ug/L		11/11/22 17:48	1
Acenaphthylene	1.5	U M	5.0	1.5	0.43	ug/L		11/11/22 17:48	1
Anthracene	1.5	U M	5.0	1.5	0.95	ug/L		11/11/22 17:48	1
Benzo[a]anthracene	4.0	U M	5.0	4.0	2.0	ug/L		11/11/22 17:48	1
Benzo[a]pyrene	5.0	U M	5.0	5.0	2.2	ug/L		11/11/22 17:48	1
Benzo[b]fluoranthene	4.0	U M	5.0	4.0	2.1	ug/L		11/11/22 17:48	1
Benzo[g,h,i]perylene	5.0	U M	5.0	5.0	2.4	ug/L		11/11/22 17:48	1
Benzo[k]fluoranthene	4.0	U M	5.0	4.0	1.8	ug/L		11/11/22 17:48	1
C9-C18 Aliphatics	30	U M	100	30	29	ug/L		11/11/22 17:48	1
C19-C36 Aliphatics	29	J M B	100	32	14	ug/L		11/11/22 17:48	1
C11-C22 Aromatics (Adjusted)	170	B	100	68	55	ug/L		11/11/22 17:48	1
Chrysene	4.0	U M	5.0	4.0	1.7	ug/L		11/11/22 17:48	1
Dibenz(a,h)anthracene	5.0	U M	5.0	5.0	2.7	ug/L		11/11/22 17:48	1
Fluoranthene	4.0	U M	5.0	4.0	1.1	ug/L		11/11/22 17:48	1
Fluorene	1.5	U M	5.0	1.5	0.64	ug/L		11/11/22 17:48	1
Indeno[1,2,3-cd]pyrene	5.0	U M	5.0	5.0	2.5	ug/L		11/11/22 17:48	1
2-Methylnaphthalene	1.5	U M	5.0	1.5	0.47	ug/L		11/11/22 17:48	1
Naphthalene	1.5	U M	5.0	1.5	0.49	ug/L		11/11/22 17:48	1
Phenanthrene	1.5	U M	5.0	1.5	0.84	ug/L		11/11/22 17:48	1
Pyrene	4.0	U M	5.0	4.0	1.1	ug/L		11/11/22 17:48	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1-Chlorooctadecane (Surr)	58		40 - 140	11/10/22 13:17	11/11/22 17:48	1
o-Terphenyl (Surr)	75		40 - 140	11/10/22 13:17	11/11/22 17:48	1
2-Fluorobiphenyl (Surr)	102		40 - 140	11/10/22 13:17	11/11/22 17:48	1

Method: SW846 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	13000		100	50	20	ug/L		11/09/22 22:05	1
Manganese	870		10	5.0	1.3	ug/L		11/09/22 22:05	1

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	160		5.0	3.0	0.86	ug/L		11/08/22 19:47	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224673-1

Client Sample ID: ZWM-01-25X-FAL22

Lab Sample ID: 680-224673-6

Date Collected: 11/01/22 15:06

Matrix: Water

Date Received: 11/03/22 11:00

Method: MA DEP MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acenaphthene	1.6	U M	5.3	1.6	0.42	ug/L		11/11/22 18:19	1
Acenaphthylene	1.6	U M	5.3	1.6	0.46	ug/L		11/11/22 18:19	1
Anthracene	1.6	U M	5.3	1.6	1.0	ug/L		11/11/22 18:19	1
Benzo[a]anthracene	4.2	U M	5.3	4.2	2.1	ug/L		11/11/22 18:19	1
Benzo[a]pyrene	5.3	U M	5.3	5.3	2.4	ug/L		11/11/22 18:19	1
Benzo[b]fluoranthene	4.2	U M	5.3	4.2	2.2	ug/L		11/11/22 18:19	1
Benzo[g,h,i]perylene	5.3	U M	5.3	5.3	2.5	ug/L		11/11/22 18:19	1
Benzo[k]fluoranthene	4.2	U M	5.3	4.2	1.9	ug/L		11/11/22 18:19	1
C9-C18 Aliphatics	32	U	110	32	31	ug/L		11/11/22 18:19	1
C19-C36 Aliphatics	40	J M B	110	34	15	ug/L		11/11/22 18:19	1
C11-C22 Aromatics (Adjusted)	72	U	110	72	58	ug/L		11/11/22 18:19	1
Chrysene	4.2	U M	5.3	4.2	1.8	ug/L		11/11/22 18:19	1
Dibenz(a,h)anthracene	5.3	U M	5.3	5.3	2.8	ug/L		11/11/22 18:19	1
Fluoranthene	4.2	U M	5.3	4.2	1.2	ug/L		11/11/22 18:19	1
Fluorene	1.6	U M	5.3	1.6	0.67	ug/L		11/11/22 18:19	1
Indeno[1,2,3-cd]pyrene	5.3	U M	5.3	5.3	2.6	ug/L		11/11/22 18:19	1
2-Methylnaphthalene	1.6	U M	5.3	1.6	0.50	ug/L		11/11/22 18:19	1
Naphthalene	1.6	U M	5.3	1.6	0.52	ug/L		11/11/22 18:19	1
Phenanthrene	1.6	U M	5.3	1.6	0.88	ug/L		11/11/22 18:19	1
Pyrene	4.2	U M	5.3	4.2	1.1	ug/L		11/11/22 18:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1-Chlorooctadecane (Surr)	55		40 - 140	11/10/22 13:17	11/11/22 18:19	1
o-Terphenyl (Surr)	56		40 - 140	11/10/22 13:17	11/11/22 18:19	1
2-Fluorobiphenyl (Surr)	100		40 - 140	11/10/22 13:17	11/11/22 18:19	1

Method: SW846 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	50	U	100	50	20	ug/L		11/09/22 22:08	1
Manganese	560		10	5.0	1.3	ug/L		11/09/22 22:08	1

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		11/08/22 19:50	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224673-1

Client Sample ID: ZWM-95-15X-FAL22

Lab Sample ID: 680-224673-7

Date Collected: 11/01/22 12:35

Matrix: Water

Date Received: 11/03/22 11:00

Method: MA DEP MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acenaphthene	1.4	U M	4.8	1.4	0.38	ug/L		11/11/22 18:49	1
Acenaphthylene	1.4	U M	4.8	1.4	0.41	ug/L		11/11/22 18:49	1
Anthracene	1.4	U M	4.8	1.4	0.91	ug/L		11/11/22 18:49	1
Benzo[a]anthracene	3.8	U M	4.8	3.8	1.9	ug/L		11/11/22 18:49	1
Benzo[a]pyrene	4.8	U M	4.8	4.8	2.1	ug/L		11/11/22 18:49	1
Benzo[b]fluoranthene	3.8	U M	4.8	3.8	2.0	ug/L		11/11/22 18:49	1
Benzo[g,h,i]perylene	4.8	U M	4.8	4.8	2.3	ug/L		11/11/22 18:49	1
Benzo[k]fluoranthene	3.8	U M	4.8	3.8	1.7	ug/L		11/11/22 18:49	1
C9-C18 Aliphatics	29	U	95	29	28	ug/L		11/11/22 18:49	1
C19-C36 Aliphatics	38	J M B	95	30	14	ug/L		11/11/22 18:49	1
C11-C22 Aromatics (Adjusted)	65	U	95	65	53	ug/L		11/11/22 18:49	1
Chrysene	3.8	U M	4.8	3.8	1.6	ug/L		11/11/22 18:49	1
Dibenz(a,h)anthracene	4.8	U M	4.8	4.8	2.5	ug/L		11/11/22 18:49	1
Fluoranthene	3.8	U M	4.8	3.8	1.1	ug/L		11/11/22 18:49	1
Fluorene	1.4	U M	4.8	1.4	0.60	ug/L		11/11/22 18:49	1
Indeno[1,2,3-cd]pyrene	4.8	U M	4.8	4.8	2.4	ug/L		11/11/22 18:49	1
2-Methylnaphthalene	1.4	U M	4.8	1.4	0.45	ug/L		11/11/22 18:49	1
Naphthalene	1.4	U M	4.8	1.4	0.47	ug/L		11/11/22 18:49	1
Phenanthrene	1.4	U M	4.8	1.4	0.80	ug/L		11/11/22 18:49	1
Pyrene	3.8	U M	4.8	3.8	1.0	ug/L		11/11/22 18:49	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1-Chlorooctadecane (Surr)	56		40 - 140	11/10/22 13:17	11/11/22 18:49	1
o-Terphenyl (Surr)	56		40 - 140	11/10/22 13:17	11/11/22 18:49	1
2-Fluorobiphenyl (Surr)	95		40 - 140	11/10/22 13:17	11/11/22 18:49	1

Method: SW846 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	2900		100	50	20	ug/L		11/09/22 22:11	1
Manganese	790		10	5.0	1.3	ug/L		11/09/22 22:11	1

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	8.9		5.0	3.0	0.86	ug/L		11/08/22 19:53	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224673-1

Client Sample ID: ZWM-99-22X-FAL22

Lab Sample ID: 680-224673-8

Date Collected: 11/01/22 08:45

Matrix: Water

Date Received: 11/03/22 11:00

Method: MA DEP MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acenaphthene	1.4	U M	4.8	1.4	0.38	ug/L		11/11/22 19:19	1
Acenaphthylene	1.4	U M	4.8	1.4	0.41	ug/L		11/11/22 19:19	1
Anthracene	1.4	U M	4.8	1.4	0.91	ug/L		11/11/22 19:19	1
Benzo[a]anthracene	3.8	U M	4.8	3.8	1.9	ug/L		11/11/22 19:19	1
Benzo[a]pyrene	4.8	U M	4.8	4.8	2.1	ug/L		11/11/22 19:19	1
Benzo[b]fluoranthene	3.8	U M	4.8	3.8	2.0	ug/L		11/11/22 19:19	1
Benzo[g,h,i]perylene	4.8	U M	4.8	4.8	2.3	ug/L		11/11/22 19:19	1
Benzo[k]fluoranthene	3.8	U M	4.8	3.8	1.7	ug/L		11/11/22 19:19	1
C9-C18 Aliphatics	31	J B	95	29	28	ug/L		11/11/22 19:19	1
C19-C36 Aliphatics	54	J M B	95	30	14	ug/L		11/11/22 19:19	1
C11-C22 Aromatics (Adjusted)	130	B	95	65	53	ug/L		11/11/22 19:19	1
Chrysene	3.8	U M	4.8	3.8	1.6	ug/L		11/11/22 19:19	1
Dibenz(a,h)anthracene	4.8	U M	4.8	4.8	2.5	ug/L		11/11/22 19:19	1
Fluoranthene	3.8	U M	4.8	3.8	1.1	ug/L		11/11/22 19:19	1
Fluorene	1.4	U M	4.8	1.4	0.60	ug/L		11/11/22 19:19	1
Indeno[1,2,3-cd]pyrene	4.8	U M	4.8	4.8	2.4	ug/L		11/11/22 19:19	1
2-Methylnaphthalene	1.4	U M	4.8	1.4	0.45	ug/L		11/11/22 19:19	1
Naphthalene	1.4	U M	4.8	1.4	0.47	ug/L		11/11/22 19:19	1
Phenanthrene	1.4	U M	4.8	1.4	0.80	ug/L		11/11/22 19:19	1
Pyrene	3.8	U M	4.8	3.8	1.0	ug/L		11/11/22 19:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1-Chlorooctadecane (Surr)	52		40 - 140	11/10/22 13:17	11/11/22 19:19	1
o-Terphenyl (Surr)	65		40 - 140	11/10/22 13:17	11/11/22 19:19	1
2-Fluorobiphenyl (Surr)	95		40 - 140	11/10/22 13:17	11/11/22 19:19	1

Method: SW846 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	13000		100	50	20	ug/L		11/09/22 22:14	1
Manganese	850		10	5.0	1.3	ug/L		11/09/22 22:14	1

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	170		5.0	3.0	0.86	ug/L		11/08/22 19:56	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224673-1

Client Sample ID: ZWM-99-23X-FAL22

Lab Sample ID: 680-224673-9

Date Collected: 11/01/22 14:35

Matrix: Water

Date Received: 11/03/22 11:00

Method: MA DEP MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acenaphthene	1.5	U M	5.0	1.5	0.40	ug/L		11/11/22 19:50	1
Acenaphthylene	1.5	U M	5.0	1.5	0.43	ug/L		11/11/22 19:50	1
Anthracene	1.5	U M	5.0	1.5	0.95	ug/L		11/11/22 19:50	1
Benzo[a]anthracene	4.0	U M	5.0	4.0	2.0	ug/L		11/11/22 19:50	1
Benzo[a]pyrene	5.0	U M	5.0	5.0	2.2	ug/L		11/11/22 19:50	1
Benzo[b]fluoranthene	4.0	U M	5.0	4.0	2.1	ug/L		11/11/22 19:50	1
Benzo[g,h,i]perylene	5.0	U M	5.0	5.0	2.4	ug/L		11/11/22 19:50	1
Benzo[k]fluoranthene	4.0	U M	5.0	4.0	1.8	ug/L		11/11/22 19:50	1
C9-C18 Aliphatics	32	J B	100	30	29	ug/L		11/11/22 19:50	1
C19-C36 Aliphatics	84	J M B	100	32	14	ug/L		11/11/22 19:50	1
C11-C22 Aromatics (Adjusted)	55	J B	100	68	55	ug/L		11/11/22 19:50	1
Chrysene	4.0	U M	5.0	4.0	1.7	ug/L		11/11/22 19:50	1
Dibenz(a,h)anthracene	5.0	U M	5.0	5.0	2.7	ug/L		11/11/22 19:50	1
Fluoranthene	4.0	U M	5.0	4.0	1.1	ug/L		11/11/22 19:50	1
Fluorene	1.5	U M	5.0	1.5	0.64	ug/L		11/11/22 19:50	1
Indeno[1,2,3-cd]pyrene	5.0	U M	5.0	5.0	2.5	ug/L		11/11/22 19:50	1
2-Methylnaphthalene	1.5	U M	5.0	1.5	0.47	ug/L		11/11/22 19:50	1
Naphthalene	1.5	U M	5.0	1.5	0.49	ug/L		11/11/22 19:50	1
Phenanthrene	1.5	U M	5.0	1.5	0.84	ug/L		11/11/22 19:50	1
Pyrene	4.0	U M	5.0	4.0	1.1	ug/L		11/11/22 19:50	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1-Chlorooctadecane (Surr)	60		40 - 140	11/10/22 13:17	11/11/22 19:50	1
o-Terphenyl (Surr)	67		40 - 140	11/10/22 13:17	11/11/22 19:50	1
2-Fluorobiphenyl (Surr)	100		40 - 140	11/10/22 13:17	11/11/22 19:50	1

Method: SW846 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	820		100	50	20	ug/L		11/09/22 22:17	1
Manganese	220		10	5.0	1.3	ug/L		11/09/22 22:17	1

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	6.1		5.0	3.0	0.86	ug/L		11/08/22 19:58	1

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224673-1

Client Sample ID: ZWM-99-24X-FAL22

Lab Sample ID: 680-224673-10

Date Collected: 11/01/22 14:05

Matrix: Water

Date Received: 11/03/22 11:00

Method: MA DEP MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acenaphthene	1.4	U M	4.8	1.4	0.38	ug/L		11/11/22 20:20	1
Acenaphthylene	1.4	U M	4.8	1.4	0.41	ug/L		11/11/22 20:20	1
Anthracene	1.4	U M	4.8	1.4	0.91	ug/L		11/11/22 20:20	1
Benzo[a]anthracene	3.8	U M	4.8	3.8	1.9	ug/L		11/11/22 20:20	1
Benzo[a]pyrene	4.8	U M	4.8	4.8	2.1	ug/L		11/11/22 20:20	1
Benzo[b]fluoranthene	3.8	U M	4.8	3.8	2.0	ug/L		11/11/22 20:20	1
Benzo[g,h,i]perylene	4.8	U M	4.8	4.8	2.3	ug/L		11/11/22 20:20	1
Benzo[k]fluoranthene	3.8	U M	4.8	3.8	1.7	ug/L		11/11/22 20:20	1
C9-C18 Aliphatics	29	J B	95	29	28	ug/L		11/11/22 20:20	1
C19-C36 Aliphatics	44	J M B	95	30	14	ug/L		11/11/22 20:20	1
C11-C22 Aromatics (Adjusted)	65	U	95	65	53	ug/L		11/11/22 20:20	1
Chrysene	3.8	U M	4.8	3.8	1.6	ug/L		11/11/22 20:20	1
Dibenz(a,h)anthracene	4.8	U M	4.8	4.8	2.5	ug/L		11/11/22 20:20	1
Fluoranthene	3.8	U M	4.8	3.8	1.1	ug/L		11/11/22 20:20	1
Fluorene	1.4	U M	4.8	1.4	0.60	ug/L		11/11/22 20:20	1
Indeno[1,2,3-cd]pyrene	4.8	U M	4.8	4.8	2.4	ug/L		11/11/22 20:20	1
2-Methylnaphthalene	1.4	U M	4.8	1.4	0.45	ug/L		11/11/22 20:20	1
Naphthalene	1.4	U M	4.8	1.4	0.47	ug/L		11/11/22 20:20	1
Phenanthrene	1.4	U M	4.8	1.4	0.80	ug/L		11/11/22 20:20	1
Pyrene	3.8	U M	4.8	3.8	1.0	ug/L		11/11/22 20:20	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1-Chlorooctadecane (Surr)	41		40 - 140	11/10/22 13:17	11/11/22 20:20	1
o-Terphenyl (Surr)	61		40 - 140	11/10/22 13:17	11/11/22 20:20	1
2-Fluorobiphenyl (Surr)	105		40 - 140	11/10/22 13:17	11/11/22 20:20	1

Method: SW846 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	21	J	100	50	20	ug/L		11/09/22 22:26	1
Manganese	92		10	5.0	1.3	ug/L		11/09/22 22:26	1

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		11/08/22 20:01	1

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224673-1

Method: MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Lab Sample ID: MB 620-17305/1-B
Matrix: Water
Analysis Batch: 17329

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 17305

Analyte	MB	MB	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Acenaphthene	1.5	U M	5.0	1.5	0.40	ug/L		11/11/22 15:18	1
Acenaphthylene	1.5	U M	5.0	1.5	0.43	ug/L		11/11/22 15:18	1
Anthracene	1.5	U M	5.0	1.5	0.95	ug/L		11/11/22 15:18	1
Benzo[a]anthracene	4.0	U M	5.0	4.0	2.0	ug/L		11/11/22 15:18	1
Benzo[a]pyrene	5.0	U M	5.0	5.0	2.2	ug/L		11/11/22 15:18	1
Benzo[b]fluoranthene	4.0	U M	5.0	4.0	2.1	ug/L		11/11/22 15:18	1
Benzo[g,h,i]perylene	5.0	U M	5.0	5.0	2.4	ug/L		11/11/22 15:18	1
Benzo[k]fluoranthene	4.0	U M	5.0	4.0	1.8	ug/L		11/11/22 15:18	1
C9-C18 Aliphatics	56.9	J	100	30	29	ug/L		11/11/22 15:18	1
C19-C36 Aliphatics	66.9	J M	100	32	14	ug/L		11/11/22 15:18	1
C11-C22 Aromatics (Adjusted)	96.2	J	100	68	55	ug/L		11/11/22 15:18	1
Chrysene	4.0	U M	5.0	4.0	1.7	ug/L		11/11/22 15:18	1
Dibenz(a,h)anthracene	5.0	U M	5.0	5.0	2.7	ug/L		11/11/22 15:18	1
Fluoranthene	4.0	U M	5.0	4.0	1.1	ug/L		11/11/22 15:18	1
Fluorene	1.5	U M	5.0	1.5	0.64	ug/L		11/11/22 15:18	1
Indeno[1,2,3-cd]pyrene	5.0	U M	5.0	5.0	2.5	ug/L		11/11/22 15:18	1
2-Methylnaphthalene	1.5	U M	5.0	1.5	0.47	ug/L		11/11/22 15:18	1
Naphthalene	1.5	U M	5.0	1.5	0.49	ug/L		11/11/22 15:18	1
Phenanthrene	1.5	U M	5.0	1.5	0.84	ug/L		11/11/22 15:18	1
Pyrene	4.0	U M	5.0	4.0	1.1	ug/L		11/11/22 15:18	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
1-Chlorooctadecane (Surr)	61		40 - 140	11/10/22 13:17	11/11/22 15:18	1
o-Terphenyl (Surr)	68		40 - 140	11/10/22 13:17	11/11/22 15:18	1
2-Fluorobiphenyl (Surr)	92		40 - 140	11/10/22 13:17	11/11/22 15:18	1

Lab Sample ID: LCS 620-17305/2-B
Matrix: Water
Analysis Batch: 17329

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 17305

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Acenaphthene	20.0	15.6		ug/L		78	40 - 140
Acenaphthylene	20.0	16.5		ug/L		82	40 - 140
Anthracene	20.0	15.0		ug/L		75	40 - 140
Benzo[a]anthracene	20.0	11.4		ug/L		57	40 - 140
Benzo[a]pyrene	20.0	15.9		ug/L		79	40 - 140
Benzo[b]fluoranthene	20.0	10.6	M	ug/L		53	40 - 140
Benzo[g,h,i]perylene	20.0	18.1		ug/L		90	40 - 140
Benzo[k]fluoranthene	20.0	14.1	M	ug/L		70	40 - 140
C9-C18 Aliphatics	120	95.1	J M	ug/L		79	40 - 140
C19-C36 Aliphatics	160	190	M	ug/L		119	40 - 140
Chrysene	20.0	18.2		ug/L		91	40 - 140
Dibenz(a,h)anthracene	20.0	16.4		ug/L		82	40 - 140
Fluoranthene	20.0	15.7		ug/L		78	40 - 140
Fluorene	20.0	15.0		ug/L		75	40 - 140
Indeno[1,2,3-cd]pyrene	20.0	11.5		ug/L		57	40 - 140
2-Methylnaphthalene	20.0	16.6		ug/L		83	40 - 140
Naphthalene	20.0	13.5	M	ug/L		67	40 - 140

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224673-1

Method: MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCS 620-17305/2-B
Matrix: Water
Analysis Batch: 17329

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 17305

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Phenanthrene	20.0	11.5		ug/L		58	40 - 140
Pyrene	20.0	16.8		ug/L		84	40 - 140

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1-Chlorooctadecane (Surr)	58		40 - 140
o-Terphenyl (Surr)	70		40 - 140
2-Fluorobiphenyl (Surr)	96		40 - 140

Lab Sample ID: LCSD 620-17305/3-B
Matrix: Water
Analysis Batch: 17329

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 17305

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit
Acenaphthene	20.0	16.1		ug/L		81	40 - 140	3	25
Acenaphthylene	20.0	18.5		ug/L		93	40 - 140	12	25
Anthracene	20.0	15.4		ug/L		77	40 - 140	3	25
Benzo[a]anthracene	20.0	12.0		ug/L		60	40 - 140	5	25
Benzo[a]pyrene	20.0	17.2		ug/L		86	40 - 140	8	25
Benzo[b]fluoranthene	20.0	13.0	M	ug/L		65	40 - 140	20	25
Benzo[g,h,i]perylene	20.0	19.6		ug/L		98	40 - 140	8	25
Benzo[k]fluoranthene	20.0	16.2	M	ug/L		81	40 - 140	14	25
C9-C18 Aliphatics	120	95.0	J M	ug/L		79	40 - 140	0	25
C19-C36 Aliphatics	160	175	M	ug/L		109	40 - 140	8	25
Chrysene	20.0	19.1		ug/L		96	40 - 140	5	25
Dibenz(a,h)anthracene	20.0	18.2		ug/L		91	40 - 140	11	25
Fluoranthene	20.0	16.2		ug/L		81	40 - 140	3	25
Fluorene	20.0	15.5		ug/L		77	40 - 140	3	25
Indeno[1,2,3-cd]pyrene	20.0	13.0		ug/L		65	40 - 140	13	25
2-Methylnaphthalene	20.0	17.0		ug/L		85	40 - 140	2	25
Naphthalene	20.0	15.0		ug/L		75	40 - 140	11	25
Phenanthrene	20.0	11.9		ug/L		59	40 - 140	3	25
Pyrene	20.0	17.2		ug/L		86	40 - 140	2	25

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1-Chlorooctadecane (Surr)	65		40 - 140
o-Terphenyl (Surr)	74		40 - 140
2-Fluorobiphenyl (Surr)	98		40 - 140

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-748987/1-A
Matrix: Water
Analysis Batch: 749946

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 748987

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	50	U	100	50	20	ug/L		11/09/22 21:01	1
Manganese	5.0	U	10	5.0	1.3	ug/L		11/09/22 21:01	1

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QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224673-1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LCS 680-748987/2-A
 Matrix: Water
 Analysis Batch: 749946

Client Sample ID: Lab Control Sample
 Prep Type: Total Recoverable
 Prep Batch: 748987

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	5000	4850		ug/L		97	87 - 115
Manganese	400	415		ug/L		104	90 - 114

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 680-748988/1-A
 Matrix: Water
 Analysis Batch: 749688

Client Sample ID: Method Blank
 Prep Type: Total Recoverable
 Prep Batch: 748988

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		11/08/22 19:12	1

Lab Sample ID: LCS 680-748988/2-A
 Matrix: Water
 Analysis Batch: 749688

Client Sample ID: Lab Control Sample
 Prep Type: Total Recoverable
 Prep Batch: 748988

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	102		ug/L		102	84 - 116

QC Association Summary

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224673-1

GC Semi VOA

Prep Batch: 17305

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224673-1	69W-94-13-FAL22	Total/NA	Water	3510C	
680-224673-2	69W-94-14-FAL22	Total/NA	Water	3510C	
680-224673-5	AOC69W-DUP01-FAL22	Total/NA	Water	3510C	
680-224673-6	ZWM-01-25X-FAL22	Total/NA	Water	3510C	
680-224673-7	ZWM-95-15X-FAL22	Total/NA	Water	3510C	
680-224673-8	ZWM-99-22X-FAL22	Total/NA	Water	3510C	
680-224673-9	ZWM-99-23X-FAL22	Total/NA	Water	3510C	
680-224673-10	ZWM-99-24X-FAL22	Total/NA	Water	3510C	
MB 620-17305/1-B	Method Blank	Total/NA	Water	3510C	
LCS 620-17305/2-B	Lab Control Sample	Total/NA	Water	3510C	
LCSD 620-17305/3-B	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 17329

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224673-1	69W-94-13-FAL22	Total/NA	Water	MAEPH2.1	17348
680-224673-2	69W-94-14-FAL22	Total/NA	Water	MAEPH2.1	17348
680-224673-5	AOC69W-DUP01-FAL22	Total/NA	Water	MAEPH2.1	17348
680-224673-6	ZWM-01-25X-FAL22	Total/NA	Water	MAEPH2.1	17348
680-224673-7	ZWM-95-15X-FAL22	Total/NA	Water	MAEPH2.1	17348
680-224673-8	ZWM-99-22X-FAL22	Total/NA	Water	MAEPH2.1	17348
680-224673-9	ZWM-99-23X-FAL22	Total/NA	Water	MAEPH2.1	17348
680-224673-10	ZWM-99-24X-FAL22	Total/NA	Water	MAEPH2.1	17348
MB 620-17305/1-B	Method Blank	Total/NA	Water	MAEPH2.1	17348
LCS 620-17305/2-B	Lab Control Sample	Total/NA	Water	MAEPH2.1	17348
LCSD 620-17305/3-B	Lab Control Sample Dup	Total/NA	Water	MAEPH2.1	17348

Fraction Batch: 17348

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224673-1	69W-94-13-FAL22	Total/NA	Water	MA EPH Frac	17305
680-224673-2	69W-94-14-FAL22	Total/NA	Water	MA EPH Frac	17305
680-224673-5	AOC69W-DUP01-FAL22	Total/NA	Water	MA EPH Frac	17305
680-224673-6	ZWM-01-25X-FAL22	Total/NA	Water	MA EPH Frac	17305
680-224673-7	ZWM-95-15X-FAL22	Total/NA	Water	MA EPH Frac	17305
680-224673-8	ZWM-99-22X-FAL22	Total/NA	Water	MA EPH Frac	17305
680-224673-9	ZWM-99-23X-FAL22	Total/NA	Water	MA EPH Frac	17305
680-224673-10	ZWM-99-24X-FAL22	Total/NA	Water	MA EPH Frac	17305
MB 620-17305/1-B	Method Blank	Total/NA	Water	MA EPH Frac	17305
LCS 620-17305/2-B	Lab Control Sample	Total/NA	Water	MA EPH Frac	17305
LCSD 620-17305/3-B	Lab Control Sample Dup	Total/NA	Water	MA EPH Frac	17305

Metals

Prep Batch: 748987

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224673-1	69W-94-13-FAL22	Dissolved	Water	3005A	
680-224673-2	69W-94-14-FAL22	Dissolved	Water	3005A	
680-224673-3	69WP-08-01-FAL22	Dissolved	Water	3005A	
680-224673-4	69WP-13-01-FAL22	Dissolved	Water	3005A	
680-224673-5	AOC69W-DUP01-FAL22	Dissolved	Water	3005A	
680-224673-6	ZWM-01-25X-FAL22	Dissolved	Water	3005A	
680-224673-7	ZWM-95-15X-FAL22	Dissolved	Water	3005A	

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QC Association Summary

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224673-1

Metals (Continued)

Prep Batch: 748987 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224673-8	ZWM-99-22X-FAL22	Dissolved	Water	3005A	
680-224673-9	ZWM-99-23X-FAL22	Dissolved	Water	3005A	
680-224673-10	ZWM-99-24X-FAL22	Dissolved	Water	3005A	
MB 680-748987/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-748987/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 748988

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224673-1	69W-94-13-FAL22	Dissolved	Water	3005A	
680-224673-2	69W-94-14-FAL22	Dissolved	Water	3005A	
680-224673-3	69WP-08-01-FAL22	Dissolved	Water	3005A	
680-224673-5	AOC69W-DUP01-FAL22	Dissolved	Water	3005A	
680-224673-6	ZWM-01-25X-FAL22	Dissolved	Water	3005A	
680-224673-7	ZWM-95-15X-FAL22	Dissolved	Water	3005A	
680-224673-8	ZWM-99-22X-FAL22	Dissolved	Water	3005A	
680-224673-9	ZWM-99-23X-FAL22	Dissolved	Water	3005A	
680-224673-10	ZWM-99-24X-FAL22	Dissolved	Water	3005A	
MB 680-748988/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-748988/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 749688

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224673-1	69W-94-13-FAL22	Dissolved	Water	6020A	748988
680-224673-2	69W-94-14-FAL22	Dissolved	Water	6020A	748988
680-224673-3	69WP-08-01-FAL22	Dissolved	Water	6020A	748988
680-224673-5	AOC69W-DUP01-FAL22	Dissolved	Water	6020A	748988
680-224673-6	ZWM-01-25X-FAL22	Dissolved	Water	6020A	748988
680-224673-7	ZWM-95-15X-FAL22	Dissolved	Water	6020A	748988
680-224673-8	ZWM-99-22X-FAL22	Dissolved	Water	6020A	748988
680-224673-9	ZWM-99-23X-FAL22	Dissolved	Water	6020A	748988
680-224673-10	ZWM-99-24X-FAL22	Dissolved	Water	6020A	748988
MB 680-748988/1-A	Method Blank	Total Recoverable	Water	6020A	748988
LCS 680-748988/2-A	Lab Control Sample	Total Recoverable	Water	6020A	748988

Analysis Batch: 749946

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224673-1	69W-94-13-FAL22	Dissolved	Water	6010C	748987
680-224673-2	69W-94-14-FAL22	Dissolved	Water	6010C	748987
680-224673-3	69WP-08-01-FAL22	Dissolved	Water	6010C	748987
680-224673-4	69WP-13-01-FAL22	Dissolved	Water	6010C	748987
680-224673-5	AOC69W-DUP01-FAL22	Dissolved	Water	6010C	748987
680-224673-6	ZWM-01-25X-FAL22	Dissolved	Water	6010C	748987
680-224673-7	ZWM-95-15X-FAL22	Dissolved	Water	6010C	748987
680-224673-8	ZWM-99-22X-FAL22	Dissolved	Water	6010C	748987
680-224673-9	ZWM-99-23X-FAL22	Dissolved	Water	6010C	748987
680-224673-10	ZWM-99-24X-FAL22	Dissolved	Water	6010C	748987
MB 680-748987/1-A	Method Blank	Total Recoverable	Water	6010C	748987
LCS 680-748987/2-A	Lab Control Sample	Total Recoverable	Water	6010C	748987

Lab Chronicle

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224673-1

Client Sample ID: 69W-94-13-FAL22

Lab Sample ID: 680-224673-1

Date Collected: 11/01/22 10:55

Matrix: Water

Date Received: 11/03/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			1050 mL	1 mL	17305	11/10/22 13:17	BMS	EET NE
Total/NA	Fraction	MA EPH Frac			1 mL	1 mL	17348	11/11/22 11:57	PRB	EET NE
Total/NA	Analysis	MAEPH2.1		1			17329	11/11/22 16:48	JS	EET NE
Instrument ID: HPS18										
Dissolved	Prep	3005A			50 mL	50 mL	748987	11/05/22 08:45	BCB	EET SAV
Dissolved	Analysis	6010C		1			749946	11/09/22 21:53	BJB	EET SAV
Instrument ID: ICPH										
Dissolved	Prep	3005A			50 mL	250 mL	748988	11/05/22 08:47	BCB	EET SAV
Dissolved	Analysis	6020A		1			749688	11/08/22 19:34	BWR	EET SAV
Instrument ID: ICPMSD										

Client Sample ID: 69W-94-14-FAL22

Lab Sample ID: 680-224673-2

Date Collected: 11/01/22 11:05

Matrix: Water

Date Received: 11/03/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			1050 mL	1 mL	17305	11/10/22 13:17	BMS	EET NE
Total/NA	Fraction	MA EPH Frac			1 mL	1 mL	17348	11/11/22 11:57	PRB	EET NE
Total/NA	Analysis	MAEPH2.1		1			17329	11/11/22 17:18	JS	EET NE
Instrument ID: HPS18										
Dissolved	Prep	3005A			50 mL	50 mL	748987	11/05/22 08:45	BCB	EET SAV
Dissolved	Analysis	6010C		1			749946	11/09/22 21:56	BJB	EET SAV
Instrument ID: ICPH										
Dissolved	Prep	3005A			50 mL	250 mL	748988	11/05/22 08:47	BCB	EET SAV
Dissolved	Analysis	6020A		1			749688	11/08/22 19:42	BWR	EET SAV
Instrument ID: ICPMSD										

Client Sample ID: 69WP-08-01-FAL22

Lab Sample ID: 680-224673-3

Date Collected: 11/01/22 13:57

Matrix: Water

Date Received: 11/03/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	748987	11/05/22 08:45	BCB	EET SAV
Dissolved	Analysis	6010C		1			749946	11/09/22 21:59	BJB	EET SAV
Instrument ID: ICPH										
Dissolved	Prep	3005A			50 mL	250 mL	748988	11/05/22 08:47	BCB	EET SAV
Dissolved	Analysis	6020A		1			749688	11/08/22 19:45	BWR	EET SAV
Instrument ID: ICPMSD										

Lab Chronicle

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224673-1

Client Sample ID: 69WP-13-01-FAL22

Lab Sample ID: 680-224673-4

Date Collected: 11/01/22 12:17

Matrix: Water

Date Received: 11/03/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	748987	11/05/22 08:45	BCB	EET SAV
Dissolved	Analysis	6010C		1			749946	11/09/22 22:02	BJB	EET SAV
Instrument ID: ICPH										

Client Sample ID: AOC69W-DUP01-FAL22

Lab Sample ID: 680-224673-5

Date Collected: 11/01/22 08:45

Matrix: Water

Date Received: 11/03/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			1000 mL	1 mL	17305	11/10/22 13:17	BMS	EET NE
Total/NA	Fraction	MA EPH Frac			1 mL	1 mL	17348	11/11/22 11:57	PRB	EET NE
Total/NA	Analysis	MAEPH2.1		1			17329	11/11/22 17:48	JS	EET NE
Instrument ID: HPS18										
Dissolved	Prep	3005A			50 mL	50 mL	748987	11/05/22 08:45	BCB	EET SAV
Dissolved	Analysis	6010C		1			749946	11/09/22 22:05	BJB	EET SAV
Instrument ID: ICPH										
Dissolved	Prep	3005A			50 mL	250 mL	748988	11/05/22 08:47	BCB	EET SAV
Dissolved	Analysis	6020A		1			749688	11/08/22 19:47	BWR	EET SAV
Instrument ID: ICPMSD										

Client Sample ID: ZWM-01-25X-FAL22

Lab Sample ID: 680-224673-6

Date Collected: 11/01/22 15:06

Matrix: Water

Date Received: 11/03/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			950 mL	1 mL	17305	11/10/22 13:17	BMS	EET NE
Total/NA	Fraction	MA EPH Frac			1 mL	1 mL	17348	11/11/22 11:57	PRB	EET NE
Total/NA	Analysis	MAEPH2.1		1			17329	11/11/22 18:19	JS	EET NE
Instrument ID: HPS18										
Dissolved	Prep	3005A			50 mL	50 mL	748987	11/05/22 08:45	BCB	EET SAV
Dissolved	Analysis	6010C		1			749946	11/09/22 22:08	BJB	EET SAV
Instrument ID: ICPH										
Dissolved	Prep	3005A			50 mL	250 mL	748988	11/05/22 08:47	BCB	EET SAV
Dissolved	Analysis	6020A		1			749688	11/08/22 19:50	BWR	EET SAV
Instrument ID: ICPMSD										

Client Sample ID: ZWM-95-15X-FAL22

Lab Sample ID: 680-224673-7

Date Collected: 11/01/22 12:35

Matrix: Water

Date Received: 11/03/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			1050 mL	1 mL	17305	11/10/22 13:17	BMS	EET NE
Total/NA	Fraction	MA EPH Frac			1 mL	1 mL	17348	11/11/22 11:57	PRB	EET NE
Total/NA	Analysis	MAEPH2.1		1			17329	11/11/22 18:49	JS	EET NE
Instrument ID: HPS18										

Lab Chronicle

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224673-1

Client Sample ID: ZWM-95-15X-FAL22

Lab Sample ID: 680-224673-7

Date Collected: 11/01/22 12:35

Matrix: Water

Date Received: 11/03/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	748987	11/05/22 08:45	BCB	EET SAV
Dissolved	Analysis	6010C		1			749946	11/09/22 22:11	BJB	EET SAV
Instrument ID: ICPH										
Dissolved	Prep	3005A			50 mL	250 mL	748988	11/05/22 08:47	BCB	EET SAV
Dissolved	Analysis	6020A		1			749688	11/08/22 19:53	BWR	EET SAV
Instrument ID: ICPMSD										

Client Sample ID: ZWM-99-22X-FAL22

Lab Sample ID: 680-224673-8

Date Collected: 11/01/22 08:45

Matrix: Water

Date Received: 11/03/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			1050 mL	1 mL	17305	11/10/22 13:17	BMS	EET NE
Total/NA	Fraction	MA EPH Frac			1 mL	1 mL	17348	11/11/22 11:57	PRB	EET NE
Total/NA	Analysis	MAEPH2.1		1			17329	11/11/22 19:19	JS	EET NE
Instrument ID: HPS18										
Dissolved	Prep	3005A			50 mL	50 mL	748987	11/05/22 08:45	BCB	EET SAV
Dissolved	Analysis	6010C		1			749946	11/09/22 22:14	BJB	EET SAV
Instrument ID: ICPH										
Dissolved	Prep	3005A			50 mL	250 mL	748988	11/05/22 08:47	BCB	EET SAV
Dissolved	Analysis	6020A		1			749688	11/08/22 19:56	BWR	EET SAV
Instrument ID: ICPMSD										

Client Sample ID: ZWM-99-23X-FAL22

Lab Sample ID: 680-224673-9

Date Collected: 11/01/22 14:35

Matrix: Water

Date Received: 11/03/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			1000 mL	1 mL	17305	11/10/22 13:17	BMS	EET NE
Total/NA	Fraction	MA EPH Frac			1 mL	1 mL	17348	11/11/22 11:57	PRB	EET NE
Total/NA	Analysis	MAEPH2.1		1			17329	11/11/22 19:50	JS	EET NE
Instrument ID: HPS18										
Dissolved	Prep	3005A			50 mL	50 mL	748987	11/05/22 08:45	BCB	EET SAV
Dissolved	Analysis	6010C		1			749946	11/09/22 22:17	BJB	EET SAV
Instrument ID: ICPH										
Dissolved	Prep	3005A			50 mL	250 mL	748988	11/05/22 08:47	BCB	EET SAV
Dissolved	Analysis	6020A		1			749688	11/08/22 19:58	BWR	EET SAV
Instrument ID: ICPMSD										

Lab Chronicle

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224673-1

Client Sample ID: ZWM-99-24X-FAL22

Lab Sample ID: 680-224673-10

Date Collected: 11/01/22 14:05

Matrix: Water

Date Received: 11/03/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			1050 mL	1 mL	17305	11/10/22 13:17	BMS	EET NE
Total/NA	Fraction	MA EPH Frac			1 mL	1 mL	17348	11/11/22 11:57	PRB	EET NE
Total/NA	Analysis	MAEPH2.1		1			17329	11/11/22 20:20	JS	EET NE
Instrument ID: HPS18										
Dissolved	Prep	3005A			50 mL	50 mL	748987	11/05/22 08:45	BCB	EET SAV
Dissolved	Analysis	6010C		1			749946	11/09/22 22:26	BJB	EET SAV
Instrument ID: ICPH										
Dissolved	Prep	3005A			50 mL	250 mL	748988	11/05/22 08:47	BCB	EET SAV
Dissolved	Analysis	6020A		1			749688	11/08/22 20:01	BWR	EET SAV
Instrument ID: ICPMSD										

Laboratory References:

EET NE = Eurofins New England, 646 Camp Ave, North Kingstown, RI 02852, TEL (413)789-9018

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224673-1

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	09-22-24

Laboratory: Eurofins New England

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	<cert No.>	02-28-23
Connecticut	State	PH-0722	07-01-23
Maine	State	RI00100	04-17-23
Massachusetts	State	M-RI907	06-30-23
New Hampshire	NELAP	2240	08-03-23
New Jersey	NELAP	RI008	06-30-23
New York	NELAP	11393	04-01-23
Rhode Island	State	LAI00368	12-30-22
USDA	US Federal Programs	P330-20-00109	04-15-23

Method Summary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224673-1

Method	Method Description	Protocol	Laboratory
MAEPH2.1	Massachusetts - Extractable Petroleum Hydrocarbons (GC)	MA DEP	EET NE
6010C	Metals (ICP)	SW846	EET SAV
6020A	Metals (ICP/MS)	SW846	EET SAV
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET SAV
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	EET NE
MA EPH Frac	Massachusetts - Extractable Petroleum Hydrocarbon Fractionation	MA DEP	EET NE

Protocol References:

MA DEP = Massachusetts Department Of Environmental Protection

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET NE = Eurofins New England, 646 Camp Ave, North Kingstown, RI 02852, TEL (413)789-9018

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
Nathan Mullens
669 Marina Drive, Suite B7 Charleston, SC 29492
(843) 478 0336, jennifer.singer@arcadis.com

COC # AOC69W_FAL20

Boston

Project Name: Former Fort Devens, Long Term Monitoring

Laboratory Eurofins Environment Testing TestAmerica, Savannah, GA

Project Number: 30130800

POC Jerry Lanier, 912-250-0281, jerry.lanier@eurofins.com

Seres-Arcadis JV, Long Term Monitoring AOC 69W Fall 2022

WBS Code: Ship to Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah GA 31404

Comments:
 MADEPEP (A) = EPH with PAHs
 SW6010C/FLDFLT (B) = Fe Mn
 SW6010C/FLDFLT (C) = Mn
 SW6020A/FLDFLT (B) = As

Equipment:

Code	Matrix
WG	Ground Water

Code	Container/Preservative
2	2x 1 Liter amber glass, 1" HCl to pH < 2; Cool < 6degC
9	1x 250mL plastic, HNO3 pH < 2; Cool < 6degC

Sample ID	Matrix	Date	Time	Samp Init.	Analytical Test Method	MADEPEP (A)	SW6010C/FLDFLT (B)	SW6010C/FLDFLT (C)	SW6020A/FLDFLT (B)	Location ID	Sample Type	Depth (ft bgs)		Cooler	Comments
												Top	Bottom		
1	WG	11-1-22	1055	DC		X	X		X	69W-94-13	N1	3.00	13.00	1	
2	WG	11-1-22	1108	GS		X	X		X	69W-94-14	N1	3.00	13.00	1	
3	WG	11-1-22	1357	SG			X		X	69WP-08-01	N1	10.00	13.00	1	
4	WG	11-1-22	1217	SG			X			69WP-13-01	N1	0.00	0.00	1	
5	WG	11-1-22	845	DC		X	X		X	ZWM-99-22X	FD1	4.60	14.60	1	
6	WG	11-1-22	1506	SG		X	X		X	ZWM-01-25X	N1	6.13	16.13	1	
7	WG	11-1-22	1235	GS		X	X		X	ZWM-95-15X	N1	5.87	15.87	1	
8	WG	11-1-22	845			X	X		X	ZWM-95-18X	N1	5.22	15.22	1	
9	WG	11-1-22	845	DC		X	X		X	ZWM-99-22X	N1	4.60	14.60	1	
10	WG	11-1-22	1435	GS		X	X		X	ZWM-99-23X	N1	4.68	14.68	1	
11	WG	11-1-22	1405	DC		X	X		X	ZWM-99-24X	N1	5.52	15.52	1	
12															
13															
14															
15															
16															

Turnaround Time: Standard



680-224673 Chain of Custody

Refiniquished by: (Signature)
Date
Time
Received by: (Signature)

Jennifer Singer
11/2/22 1520

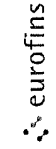
C. Lanier 11/2/22 1200
Jerry Lanier 11/3-22 1100

5.2/5/22 29/2.9
2.8/2.8

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- 11
- 12

Eurofins Savannah
 5102 LaRoche Avenue
 Savannah GA 31404
 Phone 912-354-7858 Fax: 912-352-0165

Chain of Custody Record



Client Information (Sub Contract Lab)		Lab PM Lanier Jerry A	Carrier Tracking No(s) 680-715385 1
Client Contact: Shipping/Receiving		E-Mail: Jerry.Lanier@et.eurofins.com	State of Origin: Massachusetts
Company: Eurofins Environment Testing Northeast,		Accreditations Required (See note) Dept. of Defense ELAP - A2LA, DoD - ANAB	
Address: 646 Camp Ave		Due Date Requested: 11/15/2022	
City: North Kingstown		TAT Requested (days)	
State, Zip: RI 02852		PO #	
Phone: 413-789-9018(Tel)		WO #	
Email:		Project #: 68023801	
Project Name: Fort Devens		SSOW#	
Site:			

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=soil, BT=tissue, A=air)	Field Filled Sample (Yes or No)		Petroleum Hy		Total Number of Containers	Special Instructions/Note.
					MAE/PH2/1/35/10C_14d Massachusetts Extractable	MAE/PH2/1/35/10C_14d Massachusetts Extractable	MAE/PH2/1/35/10C_14d Massachusetts Extractable	MAE/PH2/1/35/10C_14d Massachusetts Extractable		
69W94-13-FAL22 (680-224673-1)	11/1/22	10:55 Eastern	Water	Water	X	X			2	
69W94-14-FAL22 (680-224673-2)	11/1/22	11:05 Eastern	Water	Water	X	X			2	
AOC69W-DUP01-FAL22 (680-224673-5)	11/1/22	08:45 Eastern	Water	Water	X	X			2	
ZMM-01-25X-FAL22 (680-224673-6)	11/1/22	15:06 Eastern	Water	Water	X	X			2	
ZMM-95-15X-FAL22 (680-224673-7)	11/1/22	12:35 Eastern	Water	Water	X	X			2	
ZMM-99-22X-FAL22 (680-224673-8)	11/1/22	08:45 Eastern	Water	Water	X	X			2	
ZMM-99-23X-FAL22 (680-224673-9)	11/1/22	14:35 Eastern	Water	Water	X	X			2	
ZMM-99-24X-FAL22 (680-224673-10)	11/1/22	14:05 Eastern	Water	Water	X	X			2	

Note: Since laboratory accreditations are subject to change Eurofins Environment Testing Southeast, LLC places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/matrix being analyzed the samples must be shipped back to the Eurofins Environment Testing Southeast, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Southeast, LLC attention immediately. If all requested accreditations are current to date return the Chain of Custody attesting to said compliance to Eurofins Environment Testing Southeast, LLC.

Possible Hazard Identification
 Return To Client Disposal By Lab Archive For _____ Months

Special Instructions/QC Requirements

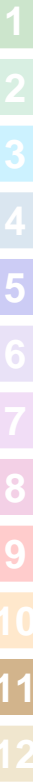
Primary Deliverable Rank: 2

Relinquished by	Date/Time	Company	Method of Shipment
Relinquished by: <i>Kerina P Jones</i>	Date/Time: 11/4/22 10:48 AM	Company	Method of Shipment: <i>Express FedEx</i>
Relinquished by: <i>Fedex</i>	Date/Time: 11/7/22 10:22	Company	Date/Time: 11/7/22 10:22
Relinquished by:	Date/Time:	Company	Date/Time:

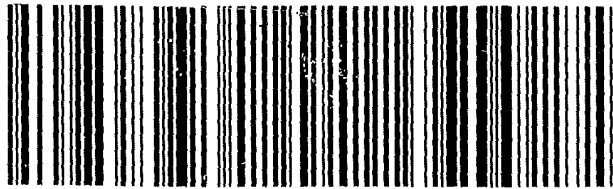
Custody Seals Intact: Yes No Custody Seal No

Cooler Temperature(s) °C and Other Remarks: *-22.0-17.0-17.0 Fele Fedex (custody seal)*

Ver: 06/08/2021



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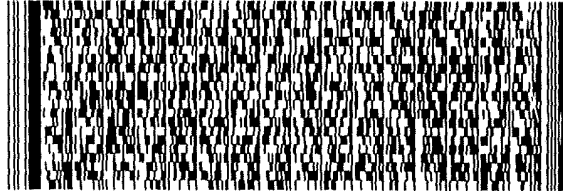
RI-US PVD
02852

XO NCOA

MPS# 1864 9070 7148 [0253]
Matr# 1864 9070 7137 [0201]

SATURDAY 12:00P
PRIORITY OVERNIGHT

2 of 2



NORTH KINGSTOWN RI 02852
REF: 8680-140498 (413) 789-9018
Po. YES

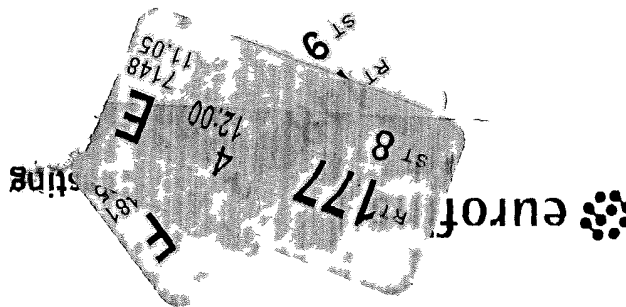
SHIPPING/RECEIVING
EUROFINS ENVIRONMENT TESTING NORTH
646 CAMP AVE

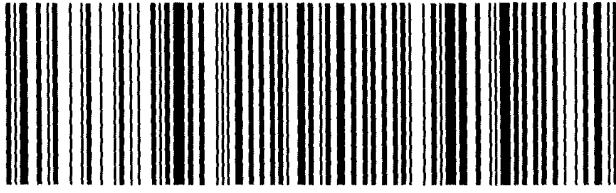
577CA/0752/4320

ORIGIN ID: SAVA (912) 354-7858
SHIPPING SAVANNAH
EUROFINS SAVANNAH
5102 LAROCHE AVE
SAVANNAH, GA 31404
UNITED STATES US

SHIP DATE: 04NOV22
ACTWGT: 50.00 LB MAN
CAD: 0148389/CAFE3616
BILL SENDER

Part # 159469-434 MTW EXP 01/23 ..





02852 PVD RI-US

XO NCOA

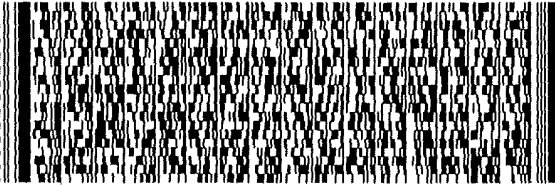
MASTER

SATURDAY 12:00P
PRIORITY OVERNIGHT

TRK# 1864 9070 7137

1 of 2

J2220220328071W



NORTH KINGSTOWN RI 02852
REF 8680-140498

PO YES

(413) 788-9018

TO SHIPPING/RECEIVING
EUROFINS ENVIRONMENT TESTING NORTH
646 CAMP AVE

577640754636

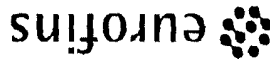
ORIGIN ID: SAVA (912) 354-7858
SHIPPING SAVANNAH
EUROFINS SAVANNAH
5102 LARGOCHIE AVE
SAVANNAH, GA 31404
UNITED STATES US

BILL SENDER

SHIP DATE: 04NOV22
ACTWGT: 50.00 LB MAN
CAD: 0148389/CAFE3616

Part # 159469-434 MTW EXP 01/23

Do not lift using this tag.



Environment Testing
TestAmerica

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Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-224673-1

Login Number: 224673

List Source: Eurofins Savannah

List Number: 1

Creator: Sims, Robert D

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-224673-1

Login Number: 224673

List Number: 2

Creator: Conti, Anthony F

List Source: Eurofins New England

List Creation: 11/07/22 11:19 AM

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	False	



ANALYTICAL REPORT

PREPARED FOR

Attn: Heather Levesque
Seres Engineering & Services LLC
669 Marina Drive
Suite B7
Charleston, South Carolina 29492

Generated 1/17/2023 5:21:07 PM Revision 2

JOB DESCRIPTION

Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

JOB NUMBER

680-224848-1


Eurofins Savannah

Job Notes

The test results in this report meet NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted. Results pertain only to samples listed in this report. This report may not be reproduced, except in full, without the written approval of the laboratory. Questions should be directed to the person who signed this report.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization



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1/17/2023 5:21:07 PM
Revision 2

Authorized for release by
Jerry Lanier, Project Manager I
Jerry.Lanier@et.eurofinsus.com
(912)250-0281

Definitions/Glossary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224848-1

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
B	Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

Metals

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Sample Summary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224848-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-224848-1	ZWM-95-18X-FAL22	Water	11/02/22 14:12	11/05/22 11:38

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Case Narrative

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224848-1

Job ID: 680-224848-1

Laboratory: Eurofins Savannah

Narrative

**Job Narrative
680-224848-1**

REVISION

The report being provided is a revision of the original report sent on 11/21/2022. The report (revision 1) is being revised due to the addition of PAH required for EPH.

Report revision history

Receipt

The samples were received on 11/5/2022 11:38 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 1.6°C and 4.2°C

GC Semi VOA

Method MAEPH2.1: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 620-17305 and 620-17348 and analytical batch 620-17329 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224848-1

Client Sample ID: ZWM-95-18X-FAL22

Lab Sample ID: 680-224848-1

Date Collected: 11/02/22 14:12

Matrix: Water

Date Received: 11/05/22 11:38

Method: MA DEP MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Acenaphthene	1.5	U M	5.0	1.5	0.40	ug/L		11/12/22 02:01	1
Acenaphthylene	1.5	U M	5.0	1.5	0.43	ug/L		11/12/22 02:01	1
Anthracene	1.5	U M	5.0	1.5	0.95	ug/L		11/12/22 02:01	1
Benzo[a]anthracene	4.0	U M	5.0	4.0	2.0	ug/L		11/12/22 02:01	1
Benzo[a]pyrene	5.0	U M	5.0	5.0	2.2	ug/L		11/12/22 02:01	1
Benzo[b]fluoranthene	4.0	U M	5.0	4.0	2.1	ug/L		11/12/22 02:01	1
Benzo[g,h,i]perylene	5.0	U M	5.0	5.0	2.4	ug/L		11/12/22 02:01	1
Benzo[k]fluoranthene	4.0	U M	5.0	4.0	1.8	ug/L		11/12/22 02:01	1
C9-C18 Aliphatics	30	U M J1	100	30	29	ug/L		11/12/22 02:01	1
C19-C36 Aliphatics	34	J M B	100	32	14	ug/L		11/12/22 02:01	1
C11-C22 Aromatics (Adjusted)	68	U	100	68	55	ug/L		11/12/22 02:01	1
Chrysene	4.0	U M	5.0	4.0	1.7	ug/L		11/12/22 02:01	1
Dibenz(a,h)anthracene	5.0	U M	5.0	5.0	2.7	ug/L		11/12/22 02:01	1
Fluoranthene	4.0	U M	5.0	4.0	1.1	ug/L		11/12/22 02:01	1
Fluorene	1.5	U M	5.0	1.5	0.64	ug/L		11/12/22 02:01	1
Indeno[1,2,3-cd]pyrene	5.0	U M	5.0	5.0	2.5	ug/L		11/12/22 02:01	1
2-Methylnaphthalene	1.5	U M	5.0	1.5	0.47	ug/L		11/12/22 02:01	1
Naphthalene	1.5	U M	5.0	1.5	0.49	ug/L		11/12/22 02:01	1
Phenanthrene	1.5	U M	5.0	1.5	0.84	ug/L		11/12/22 02:01	1
Pyrene	4.0	U M	5.0	4.0	1.1	ug/L		11/12/22 02:01	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1-Chlorooctadecane (Surr)	59		40 - 140	11/10/22 13:17	11/12/22 02:01	1
o-Terphenyl (Surr)	57		40 - 140	11/10/22 13:17	11/12/22 02:01	1
2-Fluorobiphenyl (Surr)	98		40 - 140	11/10/22 13:17	11/12/22 02:01	1

Method: SW846 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	50	U	100	50	20	ug/L		11/10/22 22:07	1
Manganese	15		10	5.0	1.3	ug/L		11/10/22 22:07	1

Method: SW846 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		11/08/22 18:01	1

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224848-1

Method: MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC)

Lab Sample ID: MB 620-17305/1-B
Matrix: Water
Analysis Batch: 17329

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 17305

Analyte	MB	MB	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Acenaphthene	1.5	U M	5.0	1.5	0.40	ug/L		11/11/22 15:18	1
Acenaphthylene	1.5	U M	5.0	1.5	0.43	ug/L		11/11/22 15:18	1
Anthracene	1.5	U M	5.0	1.5	0.95	ug/L		11/11/22 15:18	1
Benzo[a]anthracene	4.0	U M	5.0	4.0	2.0	ug/L		11/11/22 15:18	1
Benzo[a]pyrene	5.0	U M	5.0	5.0	2.2	ug/L		11/11/22 15:18	1
Benzo[b]fluoranthene	4.0	U M	5.0	4.0	2.1	ug/L		11/11/22 15:18	1
Benzo[g,h,i]perylene	5.0	U M	5.0	5.0	2.4	ug/L		11/11/22 15:18	1
Benzo[k]fluoranthene	4.0	U M	5.0	4.0	1.8	ug/L		11/11/22 15:18	1
C9-C18 Aliphatics	56.9	J	100	30	29	ug/L		11/11/22 15:18	1
C19-C36 Aliphatics	66.9	J M	100	32	14	ug/L		11/11/22 15:18	1
C11-C22 Aromatics (Adjusted)	96.2	J	100	68	55	ug/L		11/11/22 15:18	1
Chrysene	4.0	U M	5.0	4.0	1.7	ug/L		11/11/22 15:18	1
Dibenz(a,h)anthracene	5.0	U M	5.0	5.0	2.7	ug/L		11/11/22 15:18	1
Fluoranthene	4.0	U M	5.0	4.0	1.1	ug/L		11/11/22 15:18	1
Fluorene	1.5	U M	5.0	1.5	0.64	ug/L		11/11/22 15:18	1
Indeno[1,2,3-cd]pyrene	5.0	U M	5.0	5.0	2.5	ug/L		11/11/22 15:18	1
2-Methylnaphthalene	1.5	U M	5.0	1.5	0.47	ug/L		11/11/22 15:18	1
Naphthalene	1.5	U M	5.0	1.5	0.49	ug/L		11/11/22 15:18	1
Phenanthrene	1.5	U M	5.0	1.5	0.84	ug/L		11/11/22 15:18	1
Pyrene	4.0	U M	5.0	4.0	1.1	ug/L		11/11/22 15:18	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
1-Chlorooctadecane (Surr)	61		40 - 140	11/10/22 13:17	11/11/22 15:18	1
o-Terphenyl (Surr)	68		40 - 140	11/10/22 13:17	11/11/22 15:18	1
2-Fluorobiphenyl (Surr)	92		40 - 140	11/10/22 13:17	11/11/22 15:18	1

Lab Sample ID: LCS 620-17305/2-B
Matrix: Water
Analysis Batch: 17329

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 17305

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Acenaphthene	20.0	15.6		ug/L		78	40 - 140
Acenaphthylene	20.0	16.5		ug/L		82	40 - 140
Anthracene	20.0	15.0		ug/L		75	40 - 140
Benzo[a]anthracene	20.0	11.4		ug/L		57	40 - 140
Benzo[a]pyrene	20.0	15.9		ug/L		79	40 - 140
Benzo[b]fluoranthene	20.0	10.6	M	ug/L		53	40 - 140
Benzo[g,h,i]perylene	20.0	18.1		ug/L		90	40 - 140
Benzo[k]fluoranthene	20.0	14.1	M	ug/L		70	40 - 140
C9-C18 Aliphatics	120	95.1	J M	ug/L		79	40 - 140
C19-C36 Aliphatics	160	190	M	ug/L		119	40 - 140
Chrysene	20.0	18.2		ug/L		91	40 - 140
Dibenz(a,h)anthracene	20.0	16.4		ug/L		82	40 - 140
Fluoranthene	20.0	15.7		ug/L		78	40 - 140
Fluorene	20.0	15.0		ug/L		75	40 - 140
Indeno[1,2,3-cd]pyrene	20.0	11.5		ug/L		57	40 - 140
2-Methylnaphthalene	20.0	16.6		ug/L		83	40 - 140
Naphthalene	20.0	13.5	M	ug/L		67	40 - 140

Eurofins Savannah

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224848-1

Method: MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCS 620-17305/2-B
Matrix: Water
Analysis Batch: 17329

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 17305

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Phenanthrene	20.0	11.5		ug/L		58	40 - 140
Pyrene	20.0	16.8		ug/L		84	40 - 140

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1-Chlorooctadecane (Surr)	58		40 - 140
o-Terphenyl (Surr)	70		40 - 140
2-Fluorobiphenyl (Surr)	96		40 - 140

Lab Sample ID: LCSD 620-17305/3-B
Matrix: Water
Analysis Batch: 17329

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 17305

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit
Acenaphthene	20.0	16.1		ug/L		81	40 - 140	3	25
Acenaphthylene	20.0	18.5		ug/L		93	40 - 140	12	25
Anthracene	20.0	15.4		ug/L		77	40 - 140	3	25
Benzo[a]anthracene	20.0	12.0		ug/L		60	40 - 140	5	25
Benzo[a]pyrene	20.0	17.2		ug/L		86	40 - 140	8	25
Benzo[b]fluoranthene	20.0	13.0	M	ug/L		65	40 - 140	20	25
Benzo[g,h,i]perylene	20.0	19.6		ug/L		98	40 - 140	8	25
Benzo[k]fluoranthene	20.0	16.2	M	ug/L		81	40 - 140	14	25
C9-C18 Aliphatics	120	95.0	J M	ug/L		79	40 - 140	0	25
C19-C36 Aliphatics	160	175	M	ug/L		109	40 - 140	8	25
Chrysene	20.0	19.1		ug/L		96	40 - 140	5	25
Dibenz(a,h)anthracene	20.0	18.2		ug/L		91	40 - 140	11	25
Fluoranthene	20.0	16.2		ug/L		81	40 - 140	3	25
Fluorene	20.0	15.5		ug/L		77	40 - 140	3	25
Indeno[1,2,3-cd]pyrene	20.0	13.0		ug/L		65	40 - 140	13	25
2-Methylnaphthalene	20.0	17.0		ug/L		85	40 - 140	2	25
Naphthalene	20.0	15.0		ug/L		75	40 - 140	11	25
Phenanthrene	20.0	11.9		ug/L		59	40 - 140	3	25
Pyrene	20.0	17.2		ug/L		86	40 - 140	2	25

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1-Chlorooctadecane (Surr)	65		40 - 140
o-Terphenyl (Surr)	74		40 - 140
2-Fluorobiphenyl (Surr)	98		40 - 140

Lab Sample ID: 680-224848-1 MS
Matrix: Water
Analysis Batch: 17329

Client Sample ID: ZWM-95-18X-FAL22
Prep Type: Total/NA
Prep Batch: 17305

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Acenaphthene	1.5	U M	19.0	9.80		ug/L		51	40 - 140
Acenaphthylene	1.5	U M	19.0	12.0		ug/L		63	40 - 140
Anthracene	1.5	U M	19.0	11.6		ug/L		61	40 - 140
Benzo[a]anthracene	4.0	U M	19.0	11.3		ug/L		59	40 - 140
Benzo[a]pyrene	5.0	U M	19.0	16.4		ug/L		86	40 - 140

Eurofins Savannah

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224848-1

Method: MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: 680-224848-1 MS
Matrix: Water
Analysis Batch: 17329

Client Sample ID: ZWM-95-18X-FAL22
Prep Type: Total/NA
Prep Batch: 17305

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec
	Result	Qualifier		Added	Result				
Benzo[b]fluoranthene	4.0	U M	19.0	12.2	M	ug/L		64	40 - 140
Benzo[g,h,i]perylene	5.0	U M	19.0	18.4		ug/L		97	40 - 140
Benzo[k]fluoranthene	4.0	U M	19.0	14.2	M	ug/L		74	40 - 140
C9-C18 Aliphatics	30	U M J1	114	81.6	J M	ug/L		71	40 - 140
C19-C36 Aliphatics	34	J M B	152	175	M	ug/L		93	40 - 140
Chrysene	4.0	U M	19.0	18.7		ug/L		98	40 - 140
Dibenz(a,h)anthracene	5.0	U M	19.0	17.3		ug/L		91	40 - 140
Fluoranthene	4.0	U M	19.0	15.5		ug/L		81	40 - 140
Fluorene	1.5	U M	19.0	9.93		ug/L		52	40 - 140
Indeno[1,2,3-cd]pyrene	5.0	U M	19.0	12.5		ug/L		65	40 - 140
2-Methylnaphthalene	1.5	U M	19.0	10.4		ug/L		55	40 - 140
Naphthalene	1.5	U M	19.0	8.41	M	ug/L		44	40 - 140
Phenanthrene	1.5	U M	19.0	8.69		ug/L		46	40 - 140
Pyrene	4.0	U M	19.0	18.2		ug/L		96	40 - 140

Surrogate	MS	MS	Limits
	%Recovery	Qualifier	
1-Chlorooctadecane (Surr)	63		40 - 140
o-Terphenyl (Surr)	66		40 - 140
2-Fluorobiphenyl (Surr)	102		40 - 140

Lab Sample ID: 680-224848-1 MSD
Matrix: Water
Analysis Batch: 17329

Client Sample ID: ZWM-95-18X-FAL22
Prep Type: Total/NA
Prep Batch: 17305

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec	RPD	RPD
	Result	Qualifier		Added	Result						
Acenaphthene	1.5	U M	20.0	11.9		ug/L		59	40 - 140	19	50
Acenaphthylene	1.5	U M	20.0	12.5		ug/L		62	40 - 140	4	50
Anthracene	1.5	U M	20.0	12.2		ug/L		61	40 - 140	5	50
Benzo[a]anthracene	4.0	U M	20.0	12.6		ug/L		63	40 - 140	10	50
Benzo[a]pyrene	5.0	U M	20.0	17.9		ug/L		89	40 - 140	9	50
Benzo[b]fluoranthene	4.0	U M	20.0	12.0	M	ug/L		60	40 - 140	2	50
Benzo[g,h,i]perylene	5.0	U M	20.0	20.1		ug/L		101	40 - 140	9	50
Benzo[k]fluoranthene	4.0	U M	20.0	16.0	M	ug/L		80	40 - 140	12	50
C9-C18 Aliphatics	30	U M J1	120	72.1	J M	ug/L		60	40 - 140	12	50
C19-C36 Aliphatics	34	J M B	160	162	M	ug/L		80	40 - 140	8	50
Chrysene	4.0	U M	20.0	20.3		ug/L		102	40 - 140	9	50
Dibenz(a,h)anthracene	5.0	U M	20.0	19.1		ug/L		96	40 - 140	10	50
Fluoranthene	4.0	U M	20.0	16.7		ug/L		83	40 - 140	7	50
Fluorene	1.5	U M	20.0	10.1		ug/L		50	40 - 140	2	50
Indeno[1,2,3-cd]pyrene	5.0	U M	20.0	13.6		ug/L		68	40 - 140	9	50
2-Methylnaphthalene	1.5	U M	20.0	10.8		ug/L		54	40 - 140	4	50
Naphthalene	1.5	U M	20.0	9.21		ug/L		46	40 - 140	9	50
Phenanthrene	1.5	U M	20.0	9.09		ug/L		45	40 - 140	5	50
Pyrene	4.0	U M	20.0	17.4		ug/L		87	40 - 140	5	50

Surrogate	MSD	MSD	Limits
	%Recovery	Qualifier	
1-Chlorooctadecane (Surr)	62		40 - 140
o-Terphenyl (Surr)	65		40 - 140

Eurofins Savannah

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224848-1

Method: MAEPH2.1 - Massachusetts - Extractable Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: 680-224848-1 MSD
 Matrix: Water
 Analysis Batch: 17329

Client Sample ID: ZWM-95-18X-FAL22
 Prep Type: Total/NA
 Prep Batch: 17305

Surrogate	%Recovery	MSD MSD Qualifier	Limits
2-Fluorobiphenyl (Surr)	103		40 - 140

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-749294/1-A
 Matrix: Water
 Analysis Batch: 750151

Client Sample ID: Method Blank
 Prep Type: Total Recoverable
 Prep Batch: 749294

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Iron	50	U	100	50	20	ug/L		11/10/22 21:40	1
Manganese	5.0	U	10	5.0	1.3	ug/L		11/10/22 21:40	1

Lab Sample ID: LCS 680-749294/2-A
 Matrix: Water
 Analysis Batch: 750151

Client Sample ID: Lab Control Sample
 Prep Type: Total Recoverable
 Prep Batch: 749294

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	5000	5090		ug/L		102	87 - 115
Manganese	400	409		ug/L		102	90 - 114

Lab Sample ID: 680-224848-1 MS
 Matrix: Water
 Analysis Batch: 750151

Client Sample ID: ZWM-95-18X-FAL22
 Prep Type: Dissolved
 Prep Batch: 749294

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	50	U	5000	5040		ug/L		101	87 - 115
Manganese	15		400	413		ug/L		100	90 - 114

Lab Sample ID: 680-224848-1 MSD
 Matrix: Water
 Analysis Batch: 750151

Client Sample ID: ZWM-95-18X-FAL22
 Prep Type: Dissolved
 Prep Batch: 749294

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Iron	50	U	5000	5010		ug/L		100	87 - 115	1	20
Manganese	15		400	413		ug/L		100	90 - 114	0	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 680-749296/1-A
 Matrix: Water
 Analysis Batch: 749688

Client Sample ID: Method Blank
 Prep Type: Total Recoverable
 Prep Batch: 749296

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	3.0	U	5.0	3.0	0.86	ug/L		11/08/22 17:37	1

QC Sample Results

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224848-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 680-749296/2-A
Matrix: Water
Analysis Batch: 749688

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 749296

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	103		ug/L		103	84 - 116

Lab Sample ID: 680-224848-1 MS
Matrix: Water
Analysis Batch: 749688

Client Sample ID: ZWM-95-18X-FAL22
Prep Type: Dissolved
Prep Batch: 749296

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	3.0	U	100	103		ug/L		103	84 - 116

Lab Sample ID: 680-224848-1 MSD
Matrix: Water
Analysis Batch: 749688

Client Sample ID: ZWM-95-18X-FAL22
Prep Type: Dissolved
Prep Batch: 749296

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	3.0	U	100	103		ug/L		103	84 - 116	0	20

QC Association Summary

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224848-1

GC Semi VOA

Prep Batch: 17305

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224848-1	ZWM-95-18X-FAL22	Total/NA	Water	3510C	
MB 620-17305/1-B	Method Blank	Total/NA	Water	3510C	
LCS 620-17305/2-B	Lab Control Sample	Total/NA	Water	3510C	
LCSD 620-17305/3-B	Lab Control Sample Dup	Total/NA	Water	3510C	
680-224848-1 MS	ZWM-95-18X-FAL22	Total/NA	Water	3510C	
680-224848-1 MSD	ZWM-95-18X-FAL22	Total/NA	Water	3510C	

Analysis Batch: 17329

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224848-1	ZWM-95-18X-FAL22	Total/NA	Water	MAEPH2.1	17348
MB 620-17305/1-B	Method Blank	Total/NA	Water	MAEPH2.1	17348
LCS 620-17305/2-B	Lab Control Sample	Total/NA	Water	MAEPH2.1	17348
LCSD 620-17305/3-B	Lab Control Sample Dup	Total/NA	Water	MAEPH2.1	17348
680-224848-1 MS	ZWM-95-18X-FAL22	Total/NA	Water	MAEPH2.1	17348
680-224848-1 MSD	ZWM-95-18X-FAL22	Total/NA	Water	MAEPH2.1	17348

Fraction Batch: 17348

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224848-1	ZWM-95-18X-FAL22	Total/NA	Water	MA EPH Frac	17305
MB 620-17305/1-B	Method Blank	Total/NA	Water	MA EPH Frac	17305
LCS 620-17305/2-B	Lab Control Sample	Total/NA	Water	MA EPH Frac	17305
LCSD 620-17305/3-B	Lab Control Sample Dup	Total/NA	Water	MA EPH Frac	17305
680-224848-1 MS	ZWM-95-18X-FAL22	Total/NA	Water	MA EPH Frac	17305
680-224848-1 MSD	ZWM-95-18X-FAL22	Total/NA	Water	MA EPH Frac	17305

Metals

Prep Batch: 749294

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224848-1	ZWM-95-18X-FAL22	Dissolved	Water	3005A	
MB 680-749294/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-749294/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-224848-1 MS	ZWM-95-18X-FAL22	Dissolved	Water	3005A	
680-224848-1 MSD	ZWM-95-18X-FAL22	Dissolved	Water	3005A	

Prep Batch: 749296

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224848-1	ZWM-95-18X-FAL22	Dissolved	Water	3005A	
MB 680-749296/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-749296/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-224848-1 MS	ZWM-95-18X-FAL22	Dissolved	Water	3005A	
680-224848-1 MSD	ZWM-95-18X-FAL22	Dissolved	Water	3005A	

Analysis Batch: 749688

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224848-1	ZWM-95-18X-FAL22	Dissolved	Water	6020A	749296
MB 680-749296/1-A	Method Blank	Total Recoverable	Water	6020A	749296
LCS 680-749296/2-A	Lab Control Sample	Total Recoverable	Water	6020A	749296
680-224848-1 MS	ZWM-95-18X-FAL22	Dissolved	Water	6020A	749296
680-224848-1 MSD	ZWM-95-18X-FAL22	Dissolved	Water	6020A	749296

Eurofins Savannah

QC Association Summary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224848-1

Metals

Analysis Batch: 750151

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-224848-1	ZWM-95-18X-FAL22	Dissolved	Water	6010C	749294
MB 680-749294/1-A	Method Blank	Total Recoverable	Water	6010C	749294
LCS 680-749294/2-A	Lab Control Sample	Total Recoverable	Water	6010C	749294
680-224848-1 MS	ZWM-95-18X-FAL22	Dissolved	Water	6010C	749294
680-224848-1 MSD	ZWM-95-18X-FAL22	Dissolved	Water	6010C	749294

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Lab Chronicle

Client: Seres Engineering & Services LLC
 Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224848-1

Client Sample ID: ZWM-95-18X-FAL22

Lab Sample ID: 680-224848-1

Date Collected: 11/02/22 14:12

Matrix: Water

Date Received: 11/05/22 11:38

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			1000 mL	1 mL	17305	11/10/22 13:17	BMS	EET NE
Total/NA	Fraction	MA EPH Frac			1 mL	1 mL	17348	11/11/22 11:57	PRB	EET NE
Total/NA	Analysis	MAEPH2.1		1			17329	11/12/22 02:01	JS	EET NE
Instrument ID: HPS18										
Dissolved	Prep	3005A			50 mL	50 mL	749294	11/07/22 11:42	BCB	EET SAV
Dissolved	Analysis	6010C		1			750151	11/10/22 22:07	BCB	EET SAV
Instrument ID: ICPH										
Dissolved	Prep	3005A			50 mL	250 mL	749296	11/07/22 11:44	BCB	EET SAV
Dissolved	Analysis	6020A		1			749688	11/08/22 18:01	BWR	EET SAV
Instrument ID: ICPMSD										

Laboratory References:

EET NE = Eurofins New England, 646 Camp Ave, North Kingstown, RI 02852, TEL (413)789-9018

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Accreditation/Certification Summary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224848-1

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	09-22-24

Laboratory: Eurofins New England

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	<cert No.>	02-28-23
Connecticut	State	PH-0722	07-01-23
Maine	State	RI00100	04-17-23
Massachusetts	State	M-RI907	06-30-23
New Hampshire	NELAP	2240	08-03-23
New Jersey	NELAP	RI008	06-30-23
New York	NELAP	11393	04-01-23
Rhode Island	State	LAI00368	12-30-22
USDA	US Federal Programs	P330-20-00109	04-15-23

Method Summary

Client: Seres Engineering & Services LLC
Project/Site: Seres-Arcadis JV, LTM, AOC 69W, Fall 2022

Job ID: 680-224848-1

Method	Method Description	Protocol	Laboratory
MAEPH2.1	Massachusetts - Extractable Petroleum Hydrocarbons (GC)	MA DEP	EET NE
6010C	Metals (ICP)	SW846	EET SAV
6020A	Metals (ICP/MS)	SW846	EET SAV
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET SAV
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	EET NE
MA EPH Frac	Massachusetts - Extractable Petroleum Hydrocarbon Fractionation	MA DEP	EET NE

Protocol References:

MA DEP = Massachusetts Department Of Environmental Protection

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET NE = Eurofins New England, 646 Camp Ave, North Kingstown, RI 02852, TEL (413)789-9018

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

CHAIN-OF-CUSTODY RECORD

Seres-Arcadis JV
 Nathan Mullens
 669 Marina Drive, Suite B7 Charleston, SC 29492
 (843) 478 0336, jennifer.singer@arcadis.com

COC # AOC69W_FAL20

**Boston
 #215**

Project Name: Former Fort Devens, Long Term Monitoring	Laboratory: Eurofins Environment Testing TestAmerica, Savannah, GA
Project Number: 30130800	POC: Jerry Lanier, 912-250-0281 jerry.lanier@eurofinsus.com
WBS Code:	Ship to: Eurofins TestAmerica, 5102 LaRoche Avenue, Savannah GA 31404

Comments: MADEPEP (A) = EPH with PAHs SW6010C/FLDFLT (B) = Fe Mn SW6010C/FLDFLT (C) = Mn SW6020A/FLDFLT (B) = As	Analytical Test Method MADEPEP (A) SW6010C/FLDFLT (B) SW6010C/FLDFLT (C) SW6020A/FLDFLT (B)	Code Matrix WG Ground Water
		Code Container/Preservative 2 2x 1 Liter amber glass, 1:1 HCl to pH =2; Cool < 6degC 9 1x 250mL, plastic, HNO3 pH < 2; Cool < 6degC
Equipment:		

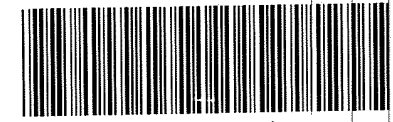
Event: Seres-Arcadis JV, Long Term Monitoring, AOC 69W, Fall 2022														
Sample ID	Matrix	Date	Time	Samp In/L	Analytical Test Method				Location ID	Sample Type	Depth (ft bgs)		Cooler	Comments
					MADEPEP (A)	SW6010C/FLDFLT (B)	SW6010C/FLDFLT (C)	SW6020A/FLDFLT (B)			Top	Bottom		
1 69W-94-13-FAL22	WG				X	X	X		69W-94-13	N1	3.00	13.00	1	
2 69W-94-14-FAL22	WG				X	X	X		69W-94-14	N1	3.00	13.00	1	
3 69WP-08-01-FAL22	WG					X	X		69WP-08-01	N1	10.00	13.00	1	
4 69WP-13-01-FAL22	WG						X		69WP-13-01	N1	0.00	0.00	1	
5 AOC69W-DUP01-FAL22	WG				X	X	X		ZWM-99-22X	FD1	4.60	14.60	1	
6 ZWM-01-25X-FAL22	WG				X	X	X		ZWM-01-25X	N1	6.13	16.13	1	
7 ZWM-95-15X-FAL22	WG				X	X	X		ZWM-95-15X	N1	5.87	15.87	1	
8 ZWM-95-18X-FAL22	WG	11/2/22	1412	SG	X	X	X		ZWM-95-18X	N1	5.22	15.22	1	MS/MSD
9 ZWM-99-22X-FAL22	WG				X	X	X		ZWM-99-22X	N1	4.60	14.60	1	
10 ZWM-99-23X-FAL22	WG				X	X	X		ZWM-99-23X	N1	4.68	14.68	1	
11 ZWM-99-24X-FAL22	WG				X	X	X		ZWM-99-24X	N1	5.52	15.52	1	
12														
13														
14														
15														
16														

Turnaround Time: Standard

[Handwritten Signature] 11/5/22 11:38
 4.2 | 5.0
 4.2 | 1.6

Relinquished by: (Signature) *Drane Chaper*
 Date 11-4-22
 Time 1510

Received by Laboratory: (Signature)
 Date
 Time



680-224848 Chain of Custody

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-224848-1

Login Number: 224848

List Source: Eurofins Savannah

List Number: 1

Creator: Padayao, Abigail

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Seres Engineering & Services LLC

Job Number: 680-224848-1

Login Number: 224848

List Number: 2

Creator: Jenkins, Brian J

List Source: Eurofins New England

List Creation: 11/08/22 09:34 AM

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	False	

Appendix C

Summary of Quality Control Exceedances and Data Validation Reports

Appendix C
Summary of Quality Control Exceedances and Data Validation Reports
2022 Annual Operations, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts



The following laboratory QC exceedances were noted during data validation:

- AOC 32/43A/spring 2022:
 - The relative percent difference between the field duplicate samples 32M-01-18XBR-SPR22 and AOC32-DUP01-SPR22 was greater than the acceptance criteria for total manganese. The total manganese results in these samples were qualified as estimated (J).
 - The continuing calibration verification (CCV) associated with VOC analysis exhibited results for 2,2-dichloropropane, chloromethane, and vinyl acetate less than the acceptance criteria. The non-detect results for 2,2-dichloropropane, chloromethane, and vinyl acetate in samples 32M-01-14XOB-SPR22, 32M-01-17XBR-SPR22, 32M-01-18XBR-SPR22, and AOC32-DUP01-SPR22 were qualified as estimated (UJ).
 - Vinyl acetate exhibited a result less than the acceptance criteria in the closing CCV. The non-detect results for vinyl acetate in sample 32M-01-13XBR-SPR22 was qualified as estimated (UJ).
 - Recoveries of 2,2-dichloropropane were less than the control limit in the laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) analyzed in association with samples 32M-01-14XOB-SPR22, 32M-01-17XBR-SPR22, 32M-01-18XBR-SPR22, and AOC32-DUP01-SPR22. The associated non-detect results were qualified as estimated (UJ) with a potential for low bias in the reported results.
 - The matrix spike (MS)/matrix spike duplicate (MSD) performed using sample 32M-01-17XBR-SPR22 exhibited recoveries for 2,2-dichloropropane less than the acceptance criteria. The 2,2-dichloropropane result in sample 32M-01-17XBR-SPR22 was qualified as estimated (UJ) with a potential for low bias in the reported result.
- AOC 57/spring 2022:
 - No deficiencies were noted.
- DCL/spring 2022:
 - The difference between the field duplicate samples DCL-DUP01-SPR22 and LFM-99-05A-SPR22 was greater than the acceptance criteria for total iron. The total iron results in these samples were qualified as estimated (UJ/J).
 - The MS/MSD performed using sample LFM-99-02B-SPR22 exhibited recoveries for chemical oxygen demand, total barium, total mercury, aldrin, alpha-BHC, gamma-BHC, heptachlor, p,p'-DDE, and chloride less than the acceptance criteria. The results for these analytes in sample LFM-99-02B-SPR22 were qualified as estimated (J/UJ) with a potential for low bias in the reported results.
 - The recoveries of benzene, methyl tert-butyl ether, C5-C8 volatile petroleum hydrocarbons aliphatic, and C9-C12 volatile petroleum hydrocarbons aliphatic were less than the control limits in the MS and/or MSD associated with the MassDEP VPH analysis performed using sample LFM-99-02B-SPR22. The non-detect results for benzene, methyl tert-butyl ether, C5-C8 volatile petroleum hydrocarbons aliphatic, and C9-C12 volatile petroleum hydrocarbons aliphatic in this sample were qualified as estimated (UJ) with a potential for low bias in the reported results.

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Main Post, Former Fort Devens Army Installation
Devens, Massachusetts



- Recovery of the MassDEP EPH surrogate compound 5-alpha-androstane was less than 10% in sample DCL-DUP01-SPR22. The results for all analytes reported in the MassDEP EPH analysis were qualified as rejected (R) in sample DCL-DUP01-SPR22. The results for the Mass DEP EPH analysis of this sample are not usable.
 - Recovery of the MassDEP EPH surrogate compound 5-alpha-androstane was less than the control limit in sample LFM-99-05A-SPR22. The non-detect results for all analytes reported in the MassDEP EPH analysis were qualified as estimated (UJ) in sample LFM-99-05A-SPR22 with a potential for low bias in the reported results.
 - Total manganese was detected in the laboratory method blank. The total manganese result in sample LFM-99-05A-SPR22 was qualified as not detected (U).
- DCL/fall 2022:
 - Sample DCL LEACHATE-FAL22 was extracted outside of the method-specified 7 day holding time (extraction 11 days from collection) for SVOC analysis. The results for all reported SVOCs in sample DCL LEACHATE-FAL22 were qualified as estimated (UJ). The results may be biased low.
 - Sample DCL LEACHATE-FAL22 was analyzed outside of the method-specified 15-minute holding time (analysis 11 days from collection) for pH analysis. The method specifies that pH should be performed as a field test. The pH result in sample DCL LEACHATE-FAL22 was qualified as estimated (J).
 - The CCV associated with pesticides analysis exhibited a result for heptachlor less than the acceptance criteria. The non-detect results for heptachlor in samples DCL-DUP01-FAL22, LFM-99-02B-FAL22, LFM-99-05A-FAL22, LFM-99-06A-RP-FAL22, and DCL LEACHATE-FAL22 were qualified as estimated (UJ).
 - Recovery of alkalinity was less than the control limit in the LCSD analyzed in association with samples DCL-DUP01-FAL22, LFM-99-02B-FAL22, LFM-99-05A-FAL22, and LFM-99-06A-RP-FAL22. The associated results were qualified as estimated (J) with a potential for low bias in the reported results.
 - Recoveries of 1,3-dichlorobenzene and hexachloroethane were less than the control limit in the LCSD analyzed in association with sample DCL LEACHATE-FAL22. The associated non-detect results were qualified as estimated (UJ) with a potential for low bias in the reported results.
 - Recoveries of C10-C28 petroleum hydrocarbons were less than the control limit in the LCS and LCSD for the MassDEP EPH analysis of sample DCL LEACHATE-FAL22. The associated non-detect result was qualified as estimated (UJ) with a potential for low bias in the reported result.
 - The MS/MSD performed using sample LFM-99-02B-FAL22 exhibited an MS recovery for naphthalene less than the acceptance criteria in the MassDEP EPH analysis. The naphthalene result in sample LFM-99-02B-FAL22 was qualified as estimated (UJ) with a potential for low bias in the reported result.

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Devens, Massachusetts



- The MS/MSD performed using sample LFM-99-02B-FAL22 exhibited a relative percent difference between the MS and MSD recoveries for cyanide greater than the acceptance criteria. The cyanide result in sample LFM-99-02B-FAL22 was qualified as estimated (J).
- Recovery of the SVOC surrogate compound phenol-d5 was less than 10% in sample DCL LEACHATE-FAL22. The non-detect results for all acid fraction analytes reported in the SVOC analysis were qualified as rejected (R) in sample DCL LEACHATE-FAL22. The results for the acid fraction analytes in this sample are not usable. The recoveries of the base/neutral fraction surrogate compounds were within the acceptance limits and no qualification of the associated analytes were required.
- C19-C36 petroleum hydrocarbons aliphatic and C9-C18 petroleum hydrocarbon aliphatic were detected in the laboratory method blank in the MassDEP EPH analysis. The C19-C36 petroleum hydrocarbons aliphatic and C9-C18 petroleum hydrocarbon aliphatic results in samples DCL-DUP01-FAL22, LFM-99-02B-FAL22, LFM-99-05A-FAL22, and LFM-99-06A-RP-FAL22 were qualified as not detected (U).
- C5-C8 volatile petroleum hydrocarbons aliphatic, C9-C10 volatile petroleum hydrocarbons aromatic, and C9-C12 volatile petroleum hydrocarbons aliphatic were detected in the laboratory method blank in the MassDEP VPH analysis. The C5-C8 volatile petroleum hydrocarbons aliphatic and C9-C10 volatile petroleum hydrocarbons aromatic results in samples DCL-DUP01-FAL22, LFM-99-05A-FAL22, and LFM-99-06A-RP-FAL22 were qualified as not detected (U). The C5-C8 volatile petroleum hydrocarbons aliphatic, C9-C10 volatile petroleum hydrocarbons aromatic, and C9-C12 volatile petroleum hydrocarbons aliphatic results in sample LFM-99-02B-FAL22 were qualified as not detected (U).
- Barium and manganese were detected in the continuing calibration blank. The manganese result in field duplicate sample DCL-DUP01-FAL22, barium and manganese results in sample LFM-99-02B-FAL22, and barium result in sample LFM-99-06A-RP-FAL22 were qualified as not detected (U).
- AOC 43G/fall 2022:
 - The alkalinity analysis of samples AAFES-2-FAL22, AOC43G-DUP01-FAL22, XGM-93-02X-FAL22, XGM-94-04X-FAL22, and XGM-97-12X-FAL22 were performed outside of the method-specified 14 day holding time (analysis 15 days from collection). The alkalinity results were qualified as estimated (J). The results may be biased low.
 - The MassDEP EPH surrogate compound 2,5-dibromotoluene exhibited recoveries greater than the control limits in samples AOC43G-DUP01-FAL22 and XGM-97-12X-FAL22. The results the detected MassDEP EPH analytes in these samples were qualified as estimated (J) with a potential for high bias in the reported concentrations.
 - The MS/MSD performed using sample XGM-94-04X-FAL22 exhibited an MSD recovery for iron less than the acceptance criteria. The iron result in sample XGM-94-04X-FAL22 was qualified as estimated (J) with a potential for low bias in the reported result.

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Devens, Massachusetts



- C9-C10 volatile petroleum hydrocarbons aromatic and C9-C12 volatile petroleum hydrocarbons aliphatic were detected in the laboratory method blank in the MassDEP VPH analysis. The C9-C10 volatile petroleum hydrocarbons aromatic and C9-C12 volatile petroleum hydrocarbons aliphatic results in sample XGM-93-02X-FAL22 were qualified as not detected (U). The C9-C12 volatile petroleum hydrocarbons aliphatic results in samples AOC43G-DUP01-FAL22 and XGM-97-12X-FAL22 were qualified as not detected (U).
- AOC 69W/fall 2022:
 - C11-C22 petroleum hydrocarbons aromatic, C19-C36 petroleum hydrocarbons aliphatic, and C9-C18 petroleum hydrocarbon aliphatic were detected in the laboratory method blank in the MassDEP EPH analysis. The C11-C22 petroleum hydrocarbons aromatic and C19-C36 petroleum hydrocarbons aliphatic results in samples 69W-94-13-FAL22 and AOC69W-DUP01-FAL22; C19-C36 petroleum hydrocarbons aliphatic result in samples 69W-94-14-FAL22, ZMW-01-25X-FAL22, ZMW-95-15X-FAL22, and ZMW-95-18X-FAL22; C11-C22 petroleum hydrocarbons aromatic, C19-C36 petroleum hydrocarbons aliphatic, and C9-C18 petroleum hydrocarbon aliphatic results in samples ZMW-99-22X-FAL22 and ZMW-99-23X-FAL22; and C19-C36 petroleum hydrocarbons aliphatic and C9-C18 petroleum hydrocarbon aliphatic results in sample ZMW-99-24X-FAL22 were qualified as not detected (U).



LABORATORY DATA CONSULTANTS, INC.

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ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

August 2, 2022

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on July 13, 2022. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #54432 C:

<u>SDG #</u>	<u>Fraction</u>
680-215075-1	Dissolved Metals

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
Project Manager/Senior Chemist
pgeng@lab-data.com

Data Validation Report for 6802150751

Facility: Former Fort Devens, Long Term Monitoring
 Event: Seres-Arcadis JV, Long Term Monitoring, AOC 57, Spring 2022
 SDG: 6802150751
 Guidance Document: Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
 Prime Contractor: Seres-Arcadis JV
 Project Manager: Jennifer Singer
 Contract Laboratory(ies): Eurofins Environment Testing TestAmerica, Savannah, GA
 Data Review Contractor: Laboratory Data Consultants Inc.
 Data Review Level: 2B
 Primary Data Reviewer: Long Ngo, Environmental Scientist
 Second Reviewer: Pei Geng, Senior Scientist
 Date Submitted: July 29, 2022

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	SW6010C	SW6010C - Dissolved	SW6020A	SW6020A - Dissolved
57M-95-03X-SPR22	680-215075-2	Water	Field Sample/N	X	X		
57M-96-11X-SPR22	680-215075-3	Water	Field Sample/N	X	X		
57-SW1-SPR22	680-215075-1	Water	Field Sample/N		X	X	
AOC57-DUP01-SPR22	680-215075-4	Water	Field Duplicate/FD	X	X		

Data Validation Report for 6802150751

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Eurofins Environment Testing TestAmerica, Savannah, GA and were reported under sample delivery group (SDG) 6802150751. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Field Duplicate RPD
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- MS Recovery
- MS RPD
- Prep Hold Time
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 0 results (0.00%) out of the 12 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Data Validation Report for 6802150751

Narrative Comments

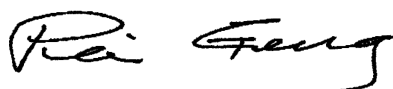
Analytical Method	Data Reviewer Comment
SW6010C	No additional comments; see Checklist for detail.
SW6020A	No additional comments; see Checklist for detail.



July 29, 2022

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.



September 19, 2022

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants Inc.

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Data Validation Report for 6802150751

No Outliers were associated with this sample delivery group.

Qualified Results

No results associated with this sample delivery group required qualification.

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

Reason Code Definitions

Code	Definition
TR	Trace Level Detect

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.

Data Validation Report for 6802150751

U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Data Validation Report for 6802150751

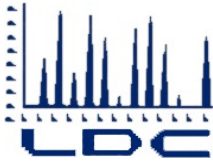
Review Questions

Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?	.			
Were target analytes reported in the field blank(s) less than MDL?			.	
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?	.			
Were MS/MSD recoveries within project acceptance limits?	.			
Was the MS/MSD RPD within project acceptance limits?	.			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	.			
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		Data acceptable as reported and qualified.

Data Validation Report for 6802150751

Review Questions

Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?	.			
Were target analytes reported in the field blank(s) less than MDL?			.	
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?		.		
Were MS/MSD recoveries within project acceptance limits?			.	
Was the MS/MSD RPD within project acceptance limits?			.	
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			.	
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were any data recommended for rejection (exclusion) in the data validation process?	.			Data acceptable as reported and qualified.



LABORATORY DATA CONSULTANTS, INC.

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ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

August 1, 2022

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on July 8, 2022. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #54387 A:

<u>SDG #</u>	<u>Fraction</u>
680-214975-1	Volatile, Arsenic, Manganese

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
Project Manager/Senior Chemist
pgeng@lab-data.com

Data Validation Report for 6802149751

Facility: Former Fort Devens, Long Term Monitoring
 Event: Seres-Arcadis JV, Long Term Monitoring, AOC 32/43A, Spring 2022
 SDG: 6802149751
 Guidance Document: Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
 Prime Contractor: Seres-Arcadis JV
 Project Manager: Jennifer Singer
 Contract Laboratory(ies): Eurofins Environment Testing TestAmerica, Savannah, GA
 Data Review Contractor: Laboratory Data Consultants, Inc.
 Data Review Level: 2B
 Primary Data Reviewer: Long Ngo, Environmental Scientist
 Second Reviewer: Pei Geng, Senior Scientist
 Date Submitted: July 27, 2022

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	SW6010C	SW6020A	SW8260B
32M-01-13XBR-SPR22	680-214975-1	Water	Field Sample/N	X	X	X
32M-01-14XOB-SPR22	680-214975-2	Water	Field Sample/N	X	X	X
32M-01-17XBR-SPR22	680-214975-3	Water	Field Sample/N	X	X	X
32M-01-18XBR-SPR22	680-214975-4	Water	Field Sample/N	X	X	X
AOC32-DUP01-SPR22	680-214975-5	Water	Field Duplicate/FD	X	X	X

Data Validation Report for 6802149751

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Eurofins Environment Testing TestAmerica, Savannah, GA and were reported under sample delivery group (SDG) 6802149751. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Field Duplicate RPD
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 15 results (4.29%) out of the 350 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Data Validation Report for 6802149751

Narrative Comments

Analytical Method	Data Reviewer Comment
SW6010C	No additional comments; see Checklist for detail.
SW6020A	No additional comments; see Checklist for detail.
SW8260B	No additional comments; see Checklist for detail.



July 27, 2022

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.



August 01, 2022

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Data Validation Report for 6802149751

Quality Control Outliers for test method SW6010C, Total, Field Duplicate RPD

Field duplicate analyses are performed in order to assess sample collection/laboratory precision for each sample matrix. Summary forms were evaluated and compared to electronic data deliverables. Field duplicate results that were outside of the acceptance criteria are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
AOC32-DUP01-SPR22 (N)	Manganese	34.48	< 30	< 30	rpd	J/None	D3	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Field Duplicate RPD for SW6010C, Total

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-01-18XBR-SPR22 680-214975-4	N	Manganese	10.0	1700	1700 J		ug/l	D3
AOC32-DUP01-SPR22 680-214975-5	FD	Manganese	10.0	1200	1200 J		ug/l	D3

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802149751

Quality Control Outliers for test method SW8260B, Continuing Calibration Verification

Compliance requirements for satisfactory continuing calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data. Continuing calibration is performed to verify and evaluate instrument performance during sample analysis. Summary forms were evaluated against project acceptance criteria, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCVIS6807208363 (CV)	Bromomethane	138.0	80 - 120	80 - 120	percent	J/None	V2	
CCVIS6807208363 (CV)	Chloroethane	126.0	80 - 120	80 - 120	percent	J/None	V2	
CCVIS68072104938 (CV)	2,2-Dichloropropane	57.00	80 - 120	80 - 120	percent	J/UJ	V2	
CCVIS68072104938 (CV)	Chloromethane	79.00	80 - 120	80 - 120	percent	J/UJ	V2	
CCVIS68072104938 (CV)	Vinyl acetate	78.00	80 - 120	80 - 120	percent	J/UJ	V2	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Continuing Calibration Verification for SW8260B

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-01-14XOB-SPR22 680-214975-2	N	2,2-Dichloropropane	2.00	1.00 U Q	1.00 UJ		ug/l	V2/C
32M-01-14XOB-SPR22 680-214975-2	N	Chloromethane	2.50	2.00 U Q	2.00 UJ		ug/l	V2
32M-01-14XOB-SPR22 680-214975-2	N	Vinyl acetate	2.50	2.00 U Q	2.00 UJ		ug/l	V2
32M-01-17XBR-SPR22 680-214975-3	N	2,2-Dichloropropane	2.00	1.00 U Q J1	1.00 UJ		ug/l	V2/C/M
32M-01-17XBR-SPR22 680-214975-3	N	Chloromethane	2.50	2.00 U Q	2.00 UJ		ug/l	V2
32M-01-17XBR-SPR22 680-214975-3	N	Vinyl acetate	2.50	2.00 U Q	2.00 UJ		ug/l	V2
32M-01-18XBR-SPR22 680-214975-4	N	2,2-Dichloropropane	2.00	1.00 U Q	1.00 UJ		ug/l	V2/C
32M-01-18XBR-SPR22 680-214975-4	N	Chloromethane	2.50	2.00 U Q	2.00 UJ		ug/l	V2
32M-01-18XBR-SPR22 680-214975-4	N	Vinyl acetate	2.50	2.00 U Q	2.00 UJ		ug/l	V2
AOC32-DUP01-SPR22 680-214975-5	FD	2,2-Dichloropropane	2.00	1.00 U Q	1.00 UJ		ug/l	V2/C
AOC32-DUP01-SPR22 680-214975-5	FD	Chloromethane	2.50	2.00 U Q	2.00 UJ		ug/l	V2
AOC32-DUP01-SPR22 680-214975-5	FD	Vinyl acetate	2.50	2.00 U Q	2.00 UJ		ug/l	V2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802149751

Quality Control Outliers for test method SW8260B, Continuing Calibration Verification

Compliance requirements for satisfactory continuing calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data. Continuing calibration is performed to verify and evaluate instrument performance during sample analysis. Summary forms were evaluated against project acceptance criteria, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCVIS68072104938 (CV)	4-Methyl-2-pentanone (MIBK)	120.6	80 - 120	80 - 120	percent	J/None	V2	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Data Validation Report for 6802149751

Quality Control Outliers for test method SW8260B, Ending Continuing Calibration Verification

Compliance requirements for satisfactory closing continuing calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data. Continuing calibration is performed to verify and evaluate instrument performance during sample analysis. Summary forms were evaluated against project acceptance criteria, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCVC68072083632 (EV)	Bromomethane	170.0	50 - 150	50 - 150	percent	J/None	V5	
CCVC68072083632 (EV)	Chloroethane	169.0	50 - 150	50 - 150	percent	J/None	V5	
CCVC68072083632 (EV)	Vinyl acetate	46.00	50 - 150	50 - 150	percent	J/UJ	V5	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Ending Continuing Calibration Verification for SW8260B

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-01-13XBR-SPR22 680-214975-1	N	Vinyl acetate	2.50	2.00 U Q	2.00 UJ		ug/l	V5

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802149751

Quality Control Outliers for test method SW8260B, LCS Recovery

The laboratory control sample/laboratory control sample duplicate (LCS/LCSD) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LCS68072104939 (BS)	2,2-Dichloropropane	57.00	60 - 139	10 - 139	percent	J/UJ	C	
LCSD68072104940 (BD)	2,2-Dichloropropane	55.00	60 - 139	10 - 139	percent	J/UJ	C	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the LCS Recovery for SW8260B

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-01-14XOB-SPR22 680-214975-2	N	2,2-Dichloropropane	2.00	1.00 U Q	1.00 UJ		ug/l	V2/C
32M-01-17XBR-SPR22 680-214975-3	N	2,2-Dichloropropane	2.00	1.00 U Q J1	1.00 UJ		ug/l	V2/C/M
32M-01-18XBR-SPR22 680-214975-4	N	2,2-Dichloropropane	2.00	1.00 U Q	1.00 UJ		ug/l	V2/C
AOC32-DUP01-SPR22 680-214975-5	FD	2,2-Dichloropropane	2.00	1.00 U Q	1.00 UJ		ug/l	V2/C

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802149751

Quality Control Outliers for test method SW8260B, LCS RPD

The objective of laboratory control sample/laboratory control sample duplicate (LCS/LCSD) RPD analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. LCS/LCSD analyses are also performed to generate data that determines the long-term precision of the analytical method on various matrices. Non-homogenous samples can impact the apparent method precision. Summary forms were evaluated and compared to electronic data deliverables. Laboratory control sample/laboratory control sample duplicate RPD results that were outside of the acceptance criteria are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LCSD68072104940 (BD)	Vinyl acetate	44.86	< 20	< 20	rpd	J/None	Z	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Data Validation Report for 6802149751

Quality Control Outliers for test method SW8260B, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
32M-01-17XBR-SPR22 (MS)	2,2-Dichloropropane	40.00	60 - 139	10 - 139	percent	J/UJ	M	
32M-01-17XBR-SPR22 (SD)	2,2-Dichloropropane	37.00	60 - 139	10 - 139	percent	J/UJ	M	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the MS Recovery for SW8260B

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-01-17XBR-SPR22 680-214975-3	N	2,2-Dichloropropane	2.00	1.00 U Q J1	1.00 UJ		ug/l	V2/C/M

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802149751

Quality Control Outliers for test method SW8260B, Surrogate

Method performance for individual samples is demonstrated through spiking activities. All samples are spiked with surrogate compounds prior to sample preparation. The sample itself may produce effects due to such factors as interferences and high concentrations of analytes. Summary forms were evaluated and compared to electronic data deliverables. Surrogate results that were outside of the acceptance criteria are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
32M-01-13XBR-SPR22 (N)	Dibromofluoromet hane	129.0	89 - 119	10 - 119	percent	J/None	I	
32M-01-13XBR-SPR22 (N)	Toluene-d8	146.0	89 - 112	10 - 112	percent	J/None	I	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Data Validation Report for 6802149751

Table of All Qualified Results

Test Method: SW6010C		Extraction Method: TOTAL						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-01-18XBR-SPR22 680-214975-4	N	Manganese	10.0	1700	1700 J		ug/l	D3
AOC32-DUP01-SPR22 680-214975-5	FD	Manganese	10.0	1200	1200 J		ug/l	D3
Test Method: SW8260B		Extraction Method: SW5030B						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
32M-01-13XBR-SPR22 680-214975-1	N	Vinyl acetate	2.50	2.00 U Q	2.00 UJ		ug/l	V5
32M-01-14XOB-SPR22 680-214975-2	N	2,2-Dichloropropane	2.00	1.00 U Q	1.00 UJ		ug/l	V2/C
32M-01-14XOB-SPR22 680-214975-2	N	Chloromethane	2.50	2.00 U Q	2.00 UJ		ug/l	V2
32M-01-14XOB-SPR22 680-214975-2	N	Vinyl acetate	2.50	2.00 U Q	2.00 UJ		ug/l	V2
32M-01-17XBR-SPR22 680-214975-3	N	2,2-Dichloropropane	2.00	1.00 U Q J1	1.00 UJ		ug/l	V2/C/M
32M-01-17XBR-SPR22 680-214975-3	N	Chloromethane	2.50	2.00 U Q	2.00 UJ		ug/l	V2
32M-01-17XBR-SPR22 680-214975-3	N	Vinyl acetate	2.50	2.00 U Q	2.00 UJ		ug/l	V2
32M-01-18XBR-SPR22 680-214975-4	N	2,2-Dichloropropane	2.00	1.00 U Q	1.00 UJ		ug/l	V2/C
32M-01-18XBR-SPR22 680-214975-4	N	Chloromethane	2.50	2.00 U Q	2.00 UJ		ug/l	V2
32M-01-18XBR-SPR22 680-214975-4	N	Vinyl acetate	2.50	2.00 U Q	2.00 UJ		ug/l	V2
AOC32-DUP01-SPR22 680-214975-5	FD	2,2-Dichloropropane	2.00	1.00 U Q	1.00 UJ		ug/l	V2/C
AOC32-DUP01-SPR22 680-214975-5	FD	Chloromethane	2.50	2.00 U Q	2.00 UJ		ug/l	V2
AOC32-DUP01-SPR22 680-214975-5	FD	Vinyl acetate	2.50	2.00 U Q	2.00 UJ		ug/l	V2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
 In instances where no LOD is provided, results are reported down to the LOQ.
 Trace values are not included in the qualified results table unless additional reason codes are associated.

Data Validation Report for 6802149751

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

Reason Code Definitions

Code	Definition
C	LCS Recovery
D3	Field Duplicate RPD
I	Surrogate recovery outside project limits.
M	MS Recovery
TR	Trace Level Detect
V2	CCV
V5	Ending Continuing Calibration Verification
Z	LCS RPD

Flag Code and Definitions

Flag	Definition
J	Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Data Validation Report for 6802149751

Review Questions

Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were CCVs run at the required frequency and within acceptance criteria?			.	
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?	.			
Were target analytes reported in the field blank(s) less than MDL?			.	
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?	.			
Were MS/MSD recoveries within project acceptance limits?	.			
Was the MS/MSD RPD within project acceptance limits?	.			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?		.		RPD for Manganese out at 34.48 for limit of 30.
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		All data is acceptable as reported or qualified during validation.

Data Validation Report for 6802149751

Review Questions

Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were CCVs run at the required frequency and within acceptance criteria?			.	
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?	.			
Were target analytes reported in the field blank(s) less than MDL?			.	
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?	.			
Were MS/MSD recoveries within project acceptance limits?	.			
Was the MS/MSD RPD within project acceptance limits?	.			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	.			
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		All data report is acceptable as reported or qualified during validation

Data Validation Report for 6802149751

Review Questions

Method: SW8260B (Volatile Organic Compounds by Capillary GC/MS)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were CCVs run at the required frequency and within acceptance criteria?		•		Due to CCV and ending CCV %D outside criteria, Seven vinyl acetate, six chloromethane and 2,2-dichloropropane results were qualified as nondetected estimated (UJ).
Were surrogate recoveries within project acceptance limits?		•		Surrogate %R for Dibromofluoromethane 129 out for limit %R 80-119 in sample 32M-01-13XBR-SPR22. The associated sample results were non-detected, therefore no data were qualified.
Was a method blank prepared and analyzed with each batch?	•			
Were field blanks (EBs or FBs) submitted with these samples?		•		Field blank was not submitted with these samples.
Were target analytes reported in the field blank(s) less than MDL?			•	
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?		•		Although 2,2-Dichloropropane LCS/LCSD %R was below criteria, the associated sample results were qualified as nondetected estimated (UJ) in four samples.
Was the LCS/LCSD RPD within project acceptance limits?		•		Although LCS/LCSD RPD were above criteria for vinyl acetate, the associated sample results were non-detected, therefore no data were qualified.
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?		•		Although 2,2-Dichloropropane MS/MSD %R was below criteria, the associated sample results were qualified as nondetected estimated (UJ).
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		All data is acceptable as reported or as qualified during data validation.

Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring
 Seres-Arcadis JV, Long Term Monitoring, AOC 32/43A, Spring 2022
 Field Duplicates for SDG: 6802149751

Location	Analysis									
32M-01-18XBR	SW6010C									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Manganese (TOTAL)	1700	1200	10.0	34.5	30	Out	NA	

Location	Analysis									
32M-01-18XBR	SW6020A									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Arsenic (TOTAL)	2.30	2.10	5.00	9.09	30	NA	OK	

Location	Analysis									
32M-01-18XBR	SW8260B									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	1,1,1,2-Tetrachloroethane	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	1,1,1-Trichloroethane	ND	ND	1.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	1,1,2,2-Tetrachloroethane	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	1,1,2-Trichloroethane	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	1,1-Dichloroethane	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	1,1-Dichloroethene	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	1,1-Dichloropropene	ND	ND	2.00	NA	30	NA	OK	

FD = Field Duplicate
 RL = Reporting Limit
 RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring

Seres-Arcadis JV, Long Term Monitoring, AOC 32/43A, Spring 2022

Field Duplicates for SDG: 6802149751

Location	Analysis									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	1,2,3-Trichlorobenzene	ND	ND	5.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	1,2,3-Trichloropropane	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	1,2,4-Trichlorobenzene	ND	ND	5.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	1,2,4-Trimethylbenzene	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	1,2-Dibromo-3-chloropropane	ND	ND	10.0	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	1,2-Dibromoethane (EDB)	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	1,2-Dichlorobenzene	160	180	2.00	11.8	30	OK	NA	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	1,2-Dichloroethane	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	1,2-Dichloroethene	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	1,2-Dichloropropane	ND	ND	1.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	1,3,5-Trimethylbenzene	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	1,3-Dichlorobenzene	27.0	31.0	2.00	13.8	30	OK	NA	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	1,3-Dichloropropane	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	1,4-Dichlorobenzene	18.0	22.0	2.00	20.0	30	OK	NA	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	2,2-Dichloropropane	ND	ND	2.00	NA	30	NA	OK	

FD = Field Duplicate

RL = Reporting Limit

RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring

Seres-Arcadis JV, Long Term Monitoring, AOC 32/43A, Spring 2022

Field Duplicates for SDG: 6802149751

Location	Analysis									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
32M-01-18XBR	SW8260B									
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	2-Butanone (MEK)	ND	ND	25.0	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	2-Chlorotoluene	ND	ND	1.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	2-Hexanone	ND	ND	20.0	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	4-Chlorotoluene	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	4-Methyl-2-pentanone (MIBK)	ND	ND	20.0	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Acetone	ND	ND	25.0	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Benzene	0.280	0.300	2.00	6.90	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Bromobenzene	ND	ND	1.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Bromochloromethane	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Bromodichloromethane	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Bromoform	ND	ND	2.50	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Bromomethane	ND	ND	20.0	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Carbon disulfide	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Carbon Tetrachloride	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Chlorobenzene	160	180	1.00	11.8	30	OK	NA	

FD = Field Duplicate

RL = Reporting Limit

RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring

Seres-Arcadis JV, Long Term Monitoring, AOC 32/43A, Spring 2022

Field Duplicates for SDG: 6802149751

Location	Analysis									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Chloroethane	ND	ND	20.0	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Chloroform	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Chloromethane	ND	ND	2.50	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	cis-1,2-Dichloroethene	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	cis-1,3-Dichloropropene	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Cumene	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Dibromochloromethane	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Dibromomethane	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Dichlorodifluoromethane	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Ethylbenzene	ND	ND	1.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Hexachlorobutadiene	ND	ND	5.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	m,p-Xylene	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Methyl tert-butyl ether (MTBE)	ND	ND	5.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Methylene chloride	ND	ND	20.0	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	n-Butylbenzene	ND	ND	2.50	NA	30	NA	OK	

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Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring

Seres-Arcadis JV, Long Term Monitoring, AOC 32/43A, Spring 2022

Field Duplicates for SDG: 6802149751

Location	Analysis									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
32M-01-18XBR	SW8260B									
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	n-Propylbenzene	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Naphthalene	ND	ND	10.0	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	o-Xylene	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	p-Cymene (p-Isopropyltoluene)	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	sec-Butylbenzene	ND	ND	2.50	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Styrene	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	tert-Butylbenzene	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Tetrachloroethene (PCE)	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Toluene	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	trans-1,2-Dichloroethene	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	trans-1,3-Dichloropropene	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Trichloroethene (TCE)	ND	ND	1.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Trichlorofluoromethane	ND	ND	2.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Vinyl acetate	ND	ND	2.50	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Vinyl chloride	ND	ND	2.00	NA	30	NA	OK	

FD = Field Duplicate

RL = Reporting Limit

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RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring

Seres-Arcadis JV, Long Term Monitoring, AOC 32/43A, Spring 2022

Field Duplicates for SDG: 6802149751

Location	Analysis									
32M-01-18XBR	SW8260B									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	680-214975-4 / 680-214975-5	Xylenes, Total	ND	ND	2.00	NA	30	NA	OK	

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LABORATORY DATA CONSULTANTS, INC.

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

August 1, 2022

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on July 8, 2022. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #54387 I:

<u>SDG #</u>	<u>Fraction</u>
SP2157	Volatile Petroleum Hydrocarbons

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
Project Manager/Senior Chemist
pgeng@lab-data.com

Data Validation Report for SP2157

Facility: Former Fort Devens, Long Term Monitoring
Event: Seres-Arcadis JV, Long Term Monitoring, AOC 32/43A, Spring 2022
SDG: SP2157
Guidance Document: Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
Prime Contractor: Seres-Arcadis JV
Project Manager: Jennifer Singer
Contract Laboratory(ies): Katahdin Analytical Services, Westbrook, ME
Data Review Contractor: Laboratory Data Consultants, Inc.
Data Review Level: 2B
Primary Data Reviewer: Pei Geng, Senior Chemist/Project Manager
Second Reviewer: Kevin Kha, Senior Scientist
Date Submitted: July 27, 2022

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	MADEPVP
32M-01-13XBR-SPR22	SP2157-1	Water	Field Sample/N	X
32M-01-14XOB-SPR22	SP2157-2	Water	Field Sample/N	X
32M-01-17XBR-SPR22	SP2157-3	Water	Field Sample/N	X
32M-01-18XBR-SPR22	SP2157-4	Water	Field Sample/N	X
AOC32-DUP01-SPR22	SP2157-5	Water	Field Duplicate/FD	X

Data Validation Report for SP2157

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Katahdin Analytical Services, Westbrook, ME and were reported under sample delivery group (SDG) SP2157. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Field Duplicate RPD
- Lab Blank
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 0 results (0.00%) out of the 50 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Data Validation Report for SP2157

Narrative Comments

Analytical Method	Data Reviewer Comment
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MADEPVP	No additional comments; see Checklist for detail.
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July 27, 2022

Reviewed by Pei Geng, Senior Chemist/Project Manager,
Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.



July 27, 2022

Reviewed by Kevin Kha, Senior Scientist, Laboratory Data
Consultants, Inc.

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Data Validation Report for SP2157

No Outliers were associated with this sample delivery group.

Qualified Results

No results associated with this sample delivery group required qualification.

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

Reason Code Definitions

Code	Definition
TR	Trace Level Detect

There are no Flag Code definitions to display.

Bias

-	The result may be biased low
---	------------------------------

Data Validation Report for SP2157

+ The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Data Validation Report for SP2157

Review Questions

Method: MADEPVP (Method for the Determination of Volatile Petroleum Hydrocarbons (VPH))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	No field blanks were submitted with these sample.
Were target analytes reported in the field blank(s) less than MDL?			•	
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		All data is acceptable as reported.

Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring

Seres-Arcadis JV, Long Term Monitoring, AOC 32/43A, Spring 2022

Field Duplicates for SDG: SP2157

Location	Analysis									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	SP2157-4 / SP2157-5	Benzene	ND	ND	3.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	SP2157-4 / SP2157-5	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	ND	ND	100	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	SP2157-4 / SP2157-5	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	210	200	100	4.88	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	SP2157-4 / SP2157-5	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	ND	ND	100	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	SP2157-4 / SP2157-5	Ethylbenzene	220	210	5.00	4.65	30	OK	NA	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	SP2157-4 / SP2157-5	m,p-Xylene	ND	ND	10.0	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	SP2157-4 / SP2157-5	Methyl tert-butyl ether (MTBE)	ND	ND	5.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	SP2157-4 / SP2157-5	Naphthalene	ND	ND	5.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	SP2157-4 / SP2157-5	o-Xylene	ND	ND	5.00	NA	30	NA	OK	
32M-01-18XBR-SPR22 / AOC32-DUP01-SPR22	SP2157-4 / SP2157-5	Toluene	ND	ND	5.00	NA	30	NA	OK	

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ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

August 2, 2022

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on July 11, 2022. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #54428 A:

<u>SDG #</u>	<u>Fraction</u>
680-215078-1	Chlorinated Pesticides, Alkalinity, COD, Cyanide, Chloride, Sulfate, Nitrate/Nitrite-N, TDS

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
Project Manager/Senior Chemist
pgeng@lab-data.com

Stage 2B EQUIS EDD

LDC# 54428 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	Pest. (8151B)		Metals (6010C/20A /7470A)		VPH (MADEP -VPH)		EPH (MADEP -EPH)		Alk (2320B)		COD (410.4)		CN- (9012B)		Cl (9056A)		NO ₃ /NO ₂ -N (353.2)		SO ₄ (9056A)		TDS (2540C)																				
				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S					
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S					
A	680-215078-1	07/11/22	07/25/22	3	0	3	0	-	-	-	-	3	0	3	0	3	0	3	0	3	0	3	0	3	0																			
B	680-215136-1	07/11/22	07/25/22	2	0	2	0	-	-	-	-	2	0	2	0	2	0	2	0	2	0	2	0	2	0																			
C	SP2156	07/11/22	07/25/22	-	-	-	-	3	0	3	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-																			
D	SP2191	07/11/22	07/25/22	-	-	-	-	2	0	2	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-																			
Total				5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

Data Validation Report for 6802150781

Facility: Former Fort Devens, Long Term Monitoring
 Event: Seres-Arcadis JV, Long Term Monitoring, DCL, Spring 2022
 SDG: 6802150781
 Guidance Document: Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
 Prime Contractor: Seres-Arcadis JV
 Project Manager: Jennifer Singer
 Contract Laboratory(ies): Eurofins Environment Testing TestAmerica, Arvada, CO | Eurofins Environment Testing TestAmerica, Savannah, GA
 Data Review Contractor: Laboratory Data Consultants Inc.
 Data Review Level: 2B
 Primary Data Reviewer: Long Ngo, Environmental Scientist
 Second Reviewer: Pei Geng, Senior Scientist
 Date Submitted: July 28, 2022

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	A2320B	A2540C	E353.2	E410.4	SW6010C	SW6020A	SW7470A	SW8081B	SW9012B	SW9056A
LFM-03-07-SPR22	680-215078-1	Water	Field Sample/N	X	X	X	X	X	X	X	X	X	X
LFM-99-02B-SPR22	680-215078-2	Water	Field Sample/N	X	X	X	X	X	X	X	X	X	X
LFM-99-06A-RP-SPR22	680-215078-3	Water	Field Sample/N	X	X	X	X	X	X	X	X	X	X

Data Validation Report for 6802150781

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Eurofins Environment Testing TestAmerica, Arvada, CO | Eurofins Environment Testing TestAmerica, Savannah, GA and were reported under sample delivery group (SDG) 6802150781. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 9 results (7.89%) out of the 114 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Data Validation Report for 6802150781

Narrative Comments


Analytical Method	Data Reviewer Comment
A2320B	No additional comments; see Checklist for detail.
A2540C	No additional comments; see Checklist for detail.
E353.2	No additional comments; see Checklist for detail.
E410.4	No additional comments; see Checklist for detail.
SW6010C	No additional comments; see Checklist for detail.
SW6020A	No additional comments; see Checklist for detail.
SW7470A	No additional comments; see Checklist for detail.
SW8081B	No additional comments; see Checklist for detail.
SW9012B	No additional comments; see Checklist for detail.
SW9056A	No additional comments; see Checklist for detail.



July 28, 2022

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.



August 01, 2022

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants Inc.

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Data Validation Report for 6802150781

Quality Control Outliers for test method A2540C, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-SPR22 (MS)	Total Dissolved Solids	60.00	80 - 120	10 - 120	percent	J/UJ	M	Spike amount Insignificant

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Data Validation Report for 6802150781

Quality Control Outliers for test method E410.4, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-SPR22 (SD)	Chemical Oxygen Demand	88.00	90 - 110	10 - 110	percent	J/UJ	M	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the MS Recovery for E410.4

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-SPR22 680-215078-2	N	Chemical Oxygen Demand	20.0	10.0 J J1	10.0 J	-	mg/l	M/TR

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802150781

Quality Control Outliers for test method SW6010C, Total, Calibration Blank

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCB680720882226 (CB)	Silver	0.6200	< 0.6	< 10	ug/l	U/None*	B2	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

*Blank flags displayed in the above table identify qualification of the sample result when it is less than or equal to the LOQ/RL. Sample results above the LOQ will be qualified based on the validation type such as J+ at the sample result.

No results associated with this QC element required qualification.

Data Validation Report for 6802150781

Quality Control Outliers for test method SW6010C, Total, Lab Blank

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
MB6807200641A (LB)	Copper	3.330	< 3.2	< 20	ug/l	U/None*	L	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

*Blank flags displayed in the above table identify qualification of the sample result when it is less than or equal to the LOQ/RL. Sample results above the LOQ will be qualified based on the validation type such as J+ at the sample result.

No results associated with this QC element required qualification.

Data Validation Report for 6802150781

Quality Control Outliers for test method SW6010C, Total, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-SPR22 (MS)	Barium	35.00	88 - 113	10 - 125	percent	J/UJ	M	
LFM-99-02B-SPR22 (SD)	Barium	37.00	88 - 113	10 - 125	percent	J/UJ	M	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the MS Recovery for SW6010C, Total

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-SPR22 680-215078-2	N	Barium	20.0	72.0 J1	72.0 J	-	ug/l	M

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802150781

Quality Control Outliers for test method SW7470A, Total, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-SPR22 (SD)	Mercury	79.00	80 - 124	10 - 124	percent	J/UJ	M	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the MS Recovery for SW7470A, Total

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-SPR22 680-215078-2	N	Mercury	0.250	0.200 U J1	0.200 UJ		ug/l	M

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802150781

Quality Control Outliers for test method SW8081B, Continuing Calibration Verification

Compliance requirements for satisfactory continuing calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data. Continuing calibration is performed to verify and evaluate instrument performance during sample analysis. Summary forms were evaluated against project acceptance criteria, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCV68072053324 (CV)	Endrin ketone	122.0	80 - 120	80 - 120	percent	J/None	V2	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Data Validation Report for 6802150781

Quality Control Outliers for test method SW8081B, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-SPR22 (MS)	Aldrin	42.00	45 - 134	10 - 134	percent	J/UJ	M	
LFM-99-02B-SPR22 (MS)	alpha-BHC (alpha-Hexachlorocyclohexane)	52.00	54 - 138	10 - 138	percent	J/UJ	M	
LFM-99-02B-SPR22 (MS)	gamma-BHC (Lindane)	53.00	59 - 134	10 - 134	percent	J/UJ	M	
LFM-99-02B-SPR22 (MS)	Heptachlor	46.00	54 - 130	10 - 130	percent	J/UJ	M	
LFM-99-02B-SPR22 (MS)	Heptachlor epoxide	60.00	61 - 133	10 - 133	percent	J/UJ	M	
LFM-99-02B-SPR22 (MS)	p,p'-DDE	53.00	57 - 135	10 - 135	percent	J/UJ	M	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the MS Recovery for SW8081B

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-SPR22 680-215078-2	N	Aldrin	0.0250	0.00740 U J1	0.00740 UJ		ug/l	M
LFM-99-02B-SPR22 680-215078-2	N	alpha-BHC (alpha-Hexachlorocyclohexane)	0.0250	0.00490 U J1	0.00490 UJ		ug/l	M
LFM-99-02B-SPR22 680-215078-2	N	gamma-BHC (Lindane)	0.0250	0.00490 U J1	0.00490 UJ		ug/l	M
LFM-99-02B-SPR22 680-215078-2	N	Heptachlor	0.0250	0.00740 U J1	0.00740 UJ		ug/l	M
LFM-99-02B-SPR22 680-215078-2	N	p,p'-DDE	0.0250	0.00740 U M J1	0.00740 UJ		ug/l	M

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802150781

Quality Control Outliers for test method SW8081B, MS RPD

The objective of matrix spikes/matrix spike duplicates (MS/MSD) RPD analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. MS/MSD analyses are also performed to generate data that determines the long-term precision of the analytical method on various matrices. Non-homogenous samples can impact the apparent method precision. Summary forms were evaluated and compared to electronic data deliverables. Matrix spikes/matrix spike duplicates results that were outside of the acceptance criteria are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-SPR22 (SD)	Aldrin	36.62	< 30	< 30	rpd	J/None	D	
LFM-99-02B-SPR22 (SD)	alpha-BHC (alpha-Hexachlorocyclohexane)	32.07	< 30	< 30	rpd	J/None	D	
LFM-99-02B-SPR22 (SD)	gamma-BHC (Lindane)	31.61	< 30	< 30	rpd	J/None	D	
LFM-99-02B-SPR22 (SD)	Heptachlor	32.02	< 30	< 30	rpd	J/None	D	
LFM-99-02B-SPR22 (SD)	p,p'-DDE	33.60	< 30	< 30	rpd	J/None	D	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Data Validation Report for 6802150781

Quality Control Outliers for test method SW9056A, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-SPR22 (MS)	Chloride	86.00	90 - 110	10 - 110	percent	J/UJ	M	
LFM-99-02B-SPR22 (SD)	Chloride	84.00	90 - 110	10 - 110	percent	J/UJ	M	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the MS Recovery for SW9056A

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-SPR22 680-215078-2	N	Chloride	2.50	170 D	170 J	-	mg/l	M

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802150781

Table of All Qualified Results

Test Method: E410.4		Extraction Method: NONE						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-SPR22 680-215078-2	N	Chemical Oxygen Demand	20.0	10.0 J J1	10.0 J	-	mg/l	M/TR
Test Method: SW6010C		Extraction Method: TOTREC						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-SPR22 680-215078-2	N	Barium	20.0	72.0 J1	72.0 J	-	ug/l	M
Test Method: SW7470A		Extraction Method: TOTAL						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-SPR22 680-215078-2	N	Mercury	0.250	0.200 U J1	0.200 UJ		ug/l	M
Test Method: SW8081B		Extraction Method: SW3520C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-SPR22 680-215078-2	N	Aldrin	0.0250	0.00740 U J1	0.00740 UJ		ug/l	M
LFM-99-02B-SPR22 680-215078-2	N	alpha-BHC (alpha-Hexachlorocyclohexane)	0.0250	0.00490 U J1	0.00490 UJ		ug/l	M
LFM-99-02B-SPR22 680-215078-2	N	gamma-BHC (Lindane)	0.0250	0.00490 U J1	0.00490 UJ		ug/l	M
LFM-99-02B-SPR22 680-215078-2	N	Heptachlor	0.0250	0.00740 U J1	0.00740 UJ		ug/l	M
LFM-99-02B-SPR22 680-215078-2	N	p,p'-DDE	0.0250	0.00740 U M J1	0.00740 UJ		ug/l	M
Test Method: SW9056A		Extraction Method: NONE						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-SPR22 680-215078-2	N	Chloride	2.50	170 D	170 J	-	mg/l	M

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.

In instances where no LOD is provided, results are reported down to the LOQ.

Trace values are not included in the qualified results table unless additional reason codes are associated.

Data Validation Report for 6802150781

Table of Results with Modified Qualifiers

Modified Qualifiers for test method SW8081B

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
LFM-99-02B-SPR22 680-215078-2	N	Heptachlor epoxide	0.0250	0.00490 U J1	0.00490 UJ	0.00490 U	

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.

In instances where no LOD is provided, results are reported down to the LOQ.

Trace values are not included in the qualified results table unless additional reason codes are associated.

Reason Code Definitions

Code	Definition
B2	CCB
D	MS RPD
L	Lab Blank
M	MS Recovery
TR	Trace Level Detect
V2	CCV

Flag Code and Definitions

Flag	Definition
J	Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Data Validation Report for 6802150781

Review Questions

Method: A2320B (Alkalinity by Titrimetric Method)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?	.			
Were target analytes reported in the field blank(s) less than MDL?			.	
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?	.			
Were MS/MSD recoveries within project acceptance limits?	.			
Was the MS/MSD RPD within project acceptance limits?	.			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			.	
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		Data acceptable as reported and qualified

Data Validation Report for 6802150781

Review Questions

Method: A2540C (Total Dissolved Solids, Dried at 180 C)

Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?	.			
Were target analytes reported in the field blank(s) less than MDL?			.	
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?	.			
Were MS/MSD recoveries within project acceptance limits?	.			
Was the MS/MSD RPD within project acceptance limits?	.			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			.	
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		Data acceptable as reported and qualified.

Data Validation Report for 6802150781

Review Questions

Method: E353.2 (Nitrogen, Nitrate-Nitrite (Colorimetric Automated, Cadmium Reduction))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?	.			
Were target analytes reported in the field blank(s) less than MDL?			.	
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?	.			
Were MS/MSD recoveries within project acceptance limits?	.			
Was the MS/MSD RPD within project acceptance limits?	.			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			.	
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		Data acceptable as reported and qualified.

Data Validation Report for 6802150781

Review Questions

Method: E410.4 (Chemical Oxygen Demand (Colorimetric, Automated Manual))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?	.			
Were field blanks (EBs or FBs) submitted with these samples?		.		
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?	.			
Were MS/MSD recoveries within project acceptance limits?		.		MSD of COD %R 88 out of limits %R 90-110.
Was the MS/MSD RPD within project acceptance limits?	.			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			.	
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		Data acceptable as reported and qualified.

Data Validation Report for 6802150781

Review Questions

Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?		.		Copper detect in MB
Were target analytes reported in the field blank(s) less than MDL?			.	
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?	.			
Were MS/MSD recoveries within project acceptance limits?		.		MS/MSD of Ba %R 35/37 out of limits %R 88-113
Was the MS/MSD RPD within project acceptance limits?	.			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			.	
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		Data acceptable as reported and qualified.

Data Validation Report for 6802150781

Review Questions

Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?	.			
Were target analytes reported in the field blank(s) less than MDL?			.	
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?	.			
Were MS/MSD recoveries within project acceptance limits?	.			
Was the MS/MSD RPD within project acceptance limits?	.			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			.	
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		Data acceptable as reported and qualified.

Data Validation Report for 6802150781

Review Questions

Method: SW7470A (Mercury in Water (Manual Cold-Vapor Technique))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were target analytes reported in the field blank(s) less than MDL?			•	
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?		•		MS/MSD of Hg %R 80/79 out of limits %R 80-124
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Data Validation Report for 6802150781

Review Questions

Method: SW8081B (Organochlorine Pesticides by Capillary GC)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?		.		CCV for Endrin Keton and Toxaphene > limits %D 20%
Were the required minimum levels of calibration standards used in the initial calibration?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	.			
Were surrogate recoveries within project acceptance limits?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were field blanks (EBs or FBs) submitted with these samples?		.		
Were target analytes reported in the field blank(s) less than MDL?			.	
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?	.			
Were MS/MSD recoveries within project acceptance limits?		.		MS for 4,4'-DDE %R 53 out of limits 57-135. MS for Aldrin %R 42 out of limits 45-134. MS for alpha-BHC %R 52 out of limits 54-138. MS for gamma-BHC %R 54 out of limits 59-134. MS for Heptachlor %R 46 out of limits 54-130.
Was the MS/MSD RPD within project acceptance limits?		.		RPD for 4'4-DDE (33), Aldrin (37), alpha-BHC (32), gamma-BHC (32), and Heptachlor (32) greater than RPD limit of 30.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			.	
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were DoD QSM corrective actions followed if deviations were noted?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		All data acceptable as reported and qualified.

Data Validation Report for 6802150781

Review Questions

Method: SW9012B (Total and Amenable Cyanide (Automated Colorimetric, with Off-Line Distillation))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?	.			
Were field blanks (EBs or FBs) submitted with these samples?		.		
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?	.			
Were MS/MSD recoveries within project acceptance limits?	.			
Was the MS/MSD RPD within project acceptance limits?	.			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			.	
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		Data acceptable as reported and qualified.

Data Validation Report for 6802150781

Review Questions

Method: SW9056A (Anion Chromatography)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?	.			
Were field blanks (EBs or FBs) submitted with these samples?		.		
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?	.			
Were MS/MSD recoveries within project acceptance limits?	.			
Was the MS/MSD RPD within project acceptance limits?	.			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			.	
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		Data acceptable as reported and qualified.



LABORATORY DATA CONSULTANTS, INC.

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

August 2, 2022

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on July 11, 2022. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #54428 B:

<u>SDG #</u>	<u>Fraction</u>
680-215136-1	Chlorinated Pesticides, Metals, Alkalinity, COD, Cyanide, Chloride, Sulfate, Nitrate/Nitrite-N, TDS

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
Project Manager/Senior Chemist
pgeng@lab-data.com

Stage 2B EQUIS EDD

LDC# 54428 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	Pest. (8151B)		Metals (6010C/20A /7470A)		VPH (MADEP -VPH)		EPH (MADEP -EPH)		Alk (2320B)		COD (410.4)		CN- (9012B)		Cl (9056A)		NO ₃ /NO ₂ -N (353.2)		SO ₄ (9056A)		TDS (2540C)																				
				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S					
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S					
A	680-215078-1	07/11/22	07/25/22	3	0	3	0	-	-	-	-	3	0	3	0	3	0	3	0	3	0	3	0	3	0																			
B	680-215136-1	07/11/22	07/25/22	2	0	2	0	-	-	-	-	2	0	2	0	2	0	2	0	2	0	2	0	2	0																			
C	SP2156	07/11/22	07/25/22	-	-	-	-	3	0	3	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-																			
D	SP2191	07/11/22	07/25/22	-	-	-	-	2	0	2	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-																			
Total				5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55

Data Validation Report for 6802151361

Facility: Former Fort Devens, Long Term Monitoring
 Event: Seres-Arcadis JV, Long Term Monitoring, DCL, Spring 2022
 SDG: 6802151361
 Guidance Document: Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
 Prime Contractor: Seres-Arcadis JV
 Project Manager: Jennifer Singer
 Contract Laboratory(ies): Eurofins Environment Testing TestAmerica, Arvada, CO | Eurofins Environment Testing TestAmerica, Savannah, GA
 Data Review Contractor: Laboratory Data Consultants Inc.
 Data Review Level: 2B
 Primary Data Reviewer: Long Ngo, Environmental Scientist
 Second Reviewer: Pei Geng, Senior Scientist
 Date Submitted: July 28, 2022

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	A2320B	A2540C	E353.2	E410.4	SW6010C	SW6020A	SW7470A	SW8081B	SW9012B	SW9056A
DCL-DUP01-SPR22	680-215136-2	Water	Field Duplicate/FD	X	X	X	X	X	X	X	X	X	X
LFM-99-05A-SPR22	680-215136-1	Water	Field Sample/N	X	X	X	X	X	X	X	X	X	X

Data Validation Report for 6802151361

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Eurofins Environment Testing TestAmerica, Arvada, CO | Eurofins Environment Testing TestAmerica, Savannah, GA and were reported under sample delivery group (SDG) 6802151361. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Field Duplicate RPD
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- LCS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 3 results (3.95%) out of the 76 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Data Validation Report for 6802151361

Narrative Comments


Analytical Method	Data Reviewer Comment
A2320B	No additional comments; see Checklist for detail.
A2540C	No additional comments; see Checklist for detail.
E353.2	No additional comments; see Checklist for detail.
E410.4	No additional comments; see Checklist for detail.
SW6010C	No additional comments; see Checklist for detail.
SW6020A	No additional comments; see Checklist for detail.
SW7470A	No additional comments; see Checklist for detail.
SW8081B	No additional comments; see Checklist for detail.
SW9012B	No additional comments; see Checklist for detail.
SW9056A	No additional comments; see Checklist for detail.



July 28, 2022

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.



August 01, 2022

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants Inc.

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Data Validation Report for 6802151361

Quality Control Outliers for test method SW6010C, Total, Field Duplicate RPD

Field duplicate analyses are performed in order to assess sample collection/laboratory precision for each sample matrix. Summary forms were evaluated and compared to electronic data deliverables. Field duplicate results that were outside of the acceptance criteria are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
DCL-DUP01-SPR22 (N)	Iron	290.0	< 100	< 100	ug/l	J/UJ	D3	5XRL

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Field Duplicate RPD for SW6010C, Total

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL-DUP01-SPR22 680-215136-2	FD	Iron	100	50.0 U	50.0 UJ		ug/l	D3
LFM-99-05A-SPR22 680-215136-1	N	Iron	100	290	290 J		ug/l	D3

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802151361

Quality Control Outliers for test method SW6010C, Total, Lab Blank

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
MB6807200851A (LB)	Manganese	7.310	< 1.3	< 10	ug/l	U/None*	L	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

*Blank flags displayed in the above table identify qualification of the sample result when it is less than or equal to the LOQ/RL. Sample results above the LOQ will be qualified based on the validation type such as J+ at the sample result.

Qualified Results associated with the Lab Blank for SW6010C, Total

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-05A-SPR22 680-215136-1	N	Manganese	10.0	9.30 J B	10.0 U		ug/l	L

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802151361

Quality Control Outliers for test method SW8081B, Continuing Calibration Verification

Compliance requirements for satisfactory continuing calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data. Continuing calibration is performed to verify and evaluate instrument performance during sample analysis. Summary forms were evaluated against project acceptance criteria, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCV68072053324 (CV)	Endrin ketone	122.0	80 - 120	80 - 120	percent	J/None	V2	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Data Validation Report for 6802151361

Table of All Qualified Results

Test Method: SW6010C		Extraction Method: TOTREC						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL-DUP01-SPR22 680-215136-2	FD	Iron	100	50.0 U	50.0 UJ		ug/l	D3
LFM-99-05A-SPR22 680-215136-1	N	Iron	100	290	290 J		ug/l	D3
LFM-99-05A-SPR22 680-215136-1	N	Manganese	10.0	9.30 J B	10.0 U		ug/l	L

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.
Trace values are not included in the qualified results table unless additional reason codes are associated.

Data Validation Report for 6802151361

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

Reason Code Definitions

Code	Definition
D3	Field Duplicate RPD
L	Lab Blank
TR	Trace Level Detect
V2	CCV

Flag Code and Definitions

Flag	Definition
J	Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Data Validation Report for 6802151361

Review Questions

Method: A2320B (Alkalinity by Titrimetric Method)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?		•		
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?		•		No MS/MSD in SDG
Were MS/MSD recoveries within project acceptance limits?			•	
Was the MS/MSD RPD within project acceptance limits?			•	
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Data Validation Report for 6802151361

Review Questions

Method: A2540C (Total Dissolved Solids, Dried at 180 C)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?	.			
Were field blanks (EBs or FBs) submitted with these samples?		.		
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?		.		No MS/MSD in SDG
Were MS/MSD recoveries within project acceptance limits?			.	
Was the MS/MSD RPD within project acceptance limits?			.	
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	.			
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		Data acceptable as reported and qualified.

Data Validation Report for 6802151361

Review Questions

Method: E353.2 (Nitrogen, Nitrate-Nitrite (Colorimetric Automated, Cadmium Reduction))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?	.			
Were target analytes reported in the field blank(s) less than MDL?			.	
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?		.		
Were MS/MSD recoveries within project acceptance limits?			.	
Was the MS/MSD RPD within project acceptance limits?			.	
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	.			
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		Data acceptable as reported and qualified.

Data Validation Report for 6802151361

Review Questions

Method: E410.4 (Chemical Oxygen Demand (Colorimetric, Automated Manual))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?	.			
Were target analytes reported in the field blank(s) less than MDL?			.	
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?		.		
Were MS/MSD recoveries within project acceptance limits?			.	
Was the MS/MSD RPD within project acceptance limits?			.	
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	.			
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		Data acceptable as reported and qualified.

Data Validation Report for 6802151361

Review Questions

Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?		.		Mn detect in blank. Qualified sample 1 as J between detect and action level.
Were field blanks (EBs or FBs) submitted with these samples?		.		
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?		.		
Were MS/MSD recoveries within project acceptance limits?			.	
Was the MS/MSD RPD within project acceptance limits?			.	
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	.			Iron, Manganese RPD out but NQ as one sample was non detect
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		Data acceptable as reported and qualified.

Data Validation Report for 6802151361

Review Questions

Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?	.			
Were target analytes reported in the field blank(s) less than MDL?			.	
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?		.		
Were MS/MSD recoveries within project acceptance limits?			.	
Was the MS/MSD RPD within project acceptance limits?			.	
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	.			Arsenic RPD 60, NQ as one sample was non detect.
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		Data acceptable as reported and qualified.

Data Validation Report for 6802151361

Review Questions

Method: SW7470A (Mercury in Water (Manual Cold-Vapor Technique))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?	.			
Were field blanks (EBs or FBs) submitted with these samples?		.		
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?		.		
Were MS/MSD recoveries within project acceptance limits?			.	
Was the MS/MSD RPD within project acceptance limits?			.	
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	.			
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		Data acceptable as reported and qualified.

Data Validation Report for 6802151361

Review Questions

Method: SW8081B (Organochlorine Pesticides by Capillary GC)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?		.		CCV for Toxaphene %D 29.6 > limits of 20%
Were the required minimum levels of calibration standards used in the initial calibration?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	.			
Were surrogate recoveries within project acceptance limits?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were field blanks (EBs or FBs) submitted with these samples?		.		
Were target analytes reported in the field blank(s) less than MDL?			.	
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?		.		
Were MS/MSD recoveries within project acceptance limits?			.	
Was the MS/MSD RPD within project acceptance limits?			.	
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	.			
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were DoD QSM corrective actions followed if deviations were noted?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		All data acceptable as reported and qualified.

Data Validation Report for 6802151361

Review Questions

Method: SW9012B (Total and Amenable Cyanide (Automated Colorimetric, with Off-Line Distillation))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?	.			
Were target analytes reported in the field blank(s) less than MDL?			.	
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?		.		
Were MS/MSD recoveries within project acceptance limits?			.	
Was the MS/MSD RPD within project acceptance limits?			.	
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	.			
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		Data acceptable as reported and qualified.

Data Validation Report for 6802151361

Review Questions

Method: SW9056A (Anion Chromatography)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were target analytes reported in the field blank(s) less than MDL?			•	
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?		•		
Were MS/MSD recoveries within project acceptance limits?			•	
Was the MS/MSD RPD within project acceptance limits?			•	
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring
 Seres-Arcadis JV, Long Term Monitoring, DCL, Spring 2022
 Field Duplicates for SDG: 6802151361

Location	Analysis									
LFM-99-05A	A2320B									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Alkalinity, Total (as CaCO3)	97.0	95.0	6.00	2.08	30	OK	NA	

Location	Analysis									
LFM-99-05A	A2540C									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Total Dissolved Solids	360	360	10.0	0.00	30	OK	NA	

Location	Analysis									
LFM-99-05A	E353.2									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Nitrate-Nitrite (as N)	0.410	0.400	0.100	2.47	30	NA	OK	

Location	Analysis									
LFM-99-05A	E410.4									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Chemical Oxygen Demand	ND	ND	20.0	NA	30	NA	OK	

Location	Analysis									
LFM-99-05A	SW6010C									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Barium (TOTREC)	12.0	11.0	20.0	8.70	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Cadmium (TOTREC)	ND	ND	5.00	NA	30	NA	OK	

FD = Field Duplicate
 RL = Reporting Limit
 RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring
 Seres-Arcadis JV, Long Term Monitoring, DCL, Spring 2022
 Field Duplicates for SDG: 6802151361

Location	Analysis									
LFM-99-05A	SW6010C									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Chromium (TOTREC)	ND	ND	10.0	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Copper (TOTREC)	ND	ND	20.0	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Iron (TOTREC)	290	ND	100	NA	30	NA	290	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Lead (TOTREC)	ND	ND	40.0	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Manganese (TOTREC)	ND	ND	10.0	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Selenium (TOTREC)	ND	ND	25.0	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Silver (TOTREC)	ND	ND	10.0	NA	30	NA	OK	

Location	Analysis									
LFM-99-05A	SW6020A									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Arsenic (TOTAL)	0.960	ND	5.00	NA	30	NA	OK	

Location	Analysis									
LFM-99-05A	SW7470A									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Mercury (TOTAL)	ND	ND	0.250	NA	30	NA	OK	

Location	Analysis									
LFM-99-05A	SW8081B									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Aldrin	ND	ND	0.0260	NA	30	NA	OK	

FD = Field Duplicate
 RL = Reporting Limit
 RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring
 Seres-Arcadis JV, Long Term Monitoring, DCL, Spring 2022
 Field Duplicates for SDG: 6802151361

Location	Analysis									
LFM-99-05A	SW8081B									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	alpha-BHC (alpha-Hexachlorocyclohexane)	ND	ND	0.0260	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	alpha-Endosulfan	ND	ND	0.0260	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	beta-BHC (beta-Hexachlorocyclohexane)	ND	ND	0.0260	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	beta-Endosulfan	ND	ND	0.0260	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Chlordane	ND	ND	0.260	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	delta-BHC (delta-Hexachlorocyclohexane)	ND	ND	0.0260	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Dieldrin	ND	ND	0.0260	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Endosulfan sulfate	ND	ND	0.0260	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Endrin	ND	ND	0.0260	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Endrin aldehyde	ND	ND	0.0260	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Endrin ketone	ND	ND	0.0260	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	gamma-BHC (Lindane)	ND	ND	0.0260	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Heptachlor	ND	ND	0.0260	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Heptachlor epoxide	ND	ND	0.0260	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Methoxychlor	ND	ND	0.0260	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	p,p'-DDD	ND	ND	0.0260	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	p,p'-DDE	ND	ND	0.0260	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	p,p'-DDT	ND	ND	0.0260	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Toxaphene	ND	ND	2.60	NA	30	NA	OK	

FD = Field Duplicate
 RL = Reporting Limit
 RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

Field Duplicate Report By SDG

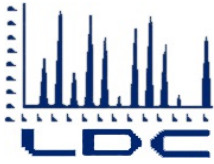
Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, DCL, Spring 2022
Field Duplicates for SDG: 6802151361

Location	Analysis									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A	SW9012B									
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Cyanide	0.00540	0.00530	0.0100	1.87	30	NA	OK	

Location	Analysis									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A	SW9056A									
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Chloride	130	130	0.500	0.00	30	OK	NA	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	680-215136-1 / 680-215136-2	Sulfate	15.0	15.0	1.00	0.00	30	OK	NA	

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"



LABORATORY DATA CONSULTANTS, INC.

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

August 4, 2022

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on July 11, 2022. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #54428 C:

<u>SDG #</u>	<u>Fraction</u>
SP2156	Volatile Petroleum Hydrocarbons, Extractable Petroleum Hydrocarbons

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
Project Manager/Senior Chemist
pgeng@lab-data.com

Stage 2B EQUIS EDD

LDC# 54428 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	Pest. (8151B)		Metals (6010C/20A /7470A)		VPH (MADEP -VPH)		EPH (MADEP -EPH)		Alk (2320B)		COD (410.4)		CN- (9012B)		Cl (9056A)		NO ₃ /NO ₂ -N (353.2)		SO ₄ (9056A)		TDS (2540C)																		
				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S					
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S			
A	680-215078-1	07/11/22	07/25/22	3	0	3	0	-	-	-	-	3	0	3	0	3	0	3	0	3	0	3	0	3	0																	
B	680-215136-1	07/11/22	07/25/22	2	0	2	0	-	-	-	-	2	0	2	0	2	0	2	0	2	0	2	0	2	0																	
C	SP2156	07/11/22	07/25/22	-	-	-	-	3	0	3	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-																	
D	SP2191	07/11/22	07/25/22	-	-	-	-	2	0	2	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-																	
Total				5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

Data Validation Report for SP2156

Facility: Former Fort Devens, Long Term Monitoring
 Event: Seres-Arcadis JV, Long Term Monitoring, DCL, Spring 2022
 SDG: SP2156
 Guidance Document: Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
 Prime Contractor: Seres-Arcadis JV
 Project Manager: Jennifer Singer
 Contract Laboratory(ies): Katahdin Analytical Services, Westbrook, ME
 Data Review Contractor: Laboratory Data Consultants Inc.
 Data Review Level: 2B
 Primary Data Reviewer: Long Ngo, Environmental Scientist
 Second Reviewer: Pei Geng, Senior Scientist
 Date Submitted: July 28, 2022

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	MADEPEP	MADEPVP
LFM-03-07-SPR22	SP2156-1	Water	Field Sample/N	X	X
LFM-99-02B-SPR22	SP2156-2	Water	Field Sample/N	X	X
LFM-99-06A-RP-SPR22	SP2156-3	Water	Field Sample/N	X	
LFM-99-06A-RP-SPR22	SP2156-3RA	Water	Field Sample/N		X

Data Validation Report for SP2156

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Katahdin Analytical Services, Westbrook, ME and were reported under sample delivery group (SDG) SP2156. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Lab Blank
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 4 results (4.44%) out of the 90 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Data Validation Report for SP2156


Narrative Comments

Analytical Method	Data Reviewer Comment
MADEPEP	No additional comments; see Checklist for detail.
MADEPVP	No additional comments; see Checklist for detail.

July 28, 2022

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.



Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants Inc.

August 01, 2022

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Data Validation Report for SP2156

Quality Control Outliers for test method MADEPEP, MS RPD

The objective of matrix spikes/matrix spike duplicates (MS/MSD) RPD analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. MS/MSD analyses are also performed to generate data that determines the long-term precision of the analytical method on various matrices. Non-homogenous samples can impact the apparent method precision. Summary forms were evaluated and compared to electronic data deliverables. Matrix spikes/matrix spike duplicates results that were outside of the acceptance criteria are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-SPR22 (SD)	2-Methylnaphthalene	37.06	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR22 (SD)	Acenaphthene	30.00	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR22 (SD)	Acenaphthylene	32.50	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR22 (SD)	Anthracene	29.96	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR22 (SD)	Benzo (a)anthracene	28.73	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR22 (SD)	Benzo(a)pyrene	28.36	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR22 (SD)	Benzo (b)fluoranthene	30.29	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR22 (SD)	Benzo (g,h,i)perylene	29.37	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR22 (SD)	Benzo (k)fluoranthene	26.62	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR22 (SD)	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	30.98	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR22 (SD)	Chrysene	28.18	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR22 (SD)	Dibenz (a,h)anthracene	29.03	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR22 (SD)	Fluoranthene	29.26	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR22 (SD)	Fluorene	29.21	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR22 (SD)	Indeno(1,2,3- c,d)pyrene	28.43	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR22 (SD)	Naphthalene	38.50	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR22 (SD)	Phenanthrene	29.40	< 25	< 25	rpd	J/None	D	
LFM-99-02B-SPR22 (SD)	Pyrene	29.45	< 25	< 25	rpd	J/None	D	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Data Validation Report for SP2156

Quality Control Outliers for test method MADEPVP, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-SPR22 (SD)	Benzene	68.00	70 - 130	10 - 130	percent	J/UJ	M	
LFM-99-02B-SPR22 (SD)	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	67.00	70 - 130	10 - 130	percent	J/UJ	M	
LFM-99-02B-SPR22 (SD)	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	67.00	70 - 130	10 - 130	percent	J/UJ	M	
LFM-99-02B-SPR22 (MS)	Methyl tert-butyl ether (MTBE)	68.00	70 - 130	10 - 130	percent	J/UJ	M	
LFM-99-02B-SPR22 (SD)	Methyl tert-butyl ether (MTBE)	64.00	70 - 130	10 - 130	percent	J/UJ	M	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the MS Recovery for MADEPVP

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-SPR22 SP2156-2	N	Benzene	3.00	2.00 U	2.00 UJ		ug/l	M
LFM-99-02B-SPR22 SP2156-2	N	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	75.0 U	75.0 UJ		ug/l	M
LFM-99-02B-SPR22 SP2156-2	N	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	75.0 U	75.0 UJ		ug/l	M
LFM-99-02B-SPR22 SP2156-2	N	Methyl tert-butyl ether (MTBE)	5.00	3.80 U	3.80 UJ		ug/l	M

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for SP2156

Table of All Qualified Results

Test Method: MADEPVP		Extraction Method: METHOD						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-SPR22 SP2156-2	N	Benzene	3.00	2.00 U	2.00 UJ		ug/l	M
LFM-99-02B-SPR22 SP2156-2	N	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	75.0 U	75.0 UJ		ug/l	M
LFM-99-02B-SPR22 SP2156-2	N	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	75.0 U	75.0 UJ		ug/l	M
LFM-99-02B-SPR22 SP2156-2	N	Methyl tert-butyl ether (MTBE)	5.00	3.80 U	3.80 UJ		ug/l	M

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.

In instances where no LOD is provided, results are reported down to the LOQ.

Trace values are not included in the qualified results table unless additional reason codes are associated.

Data Validation Report for SP2156

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

Reason Code Definitions

Code	Definition
D	MS RPD
M	MS Recovery
TR	Trace Level Detect

Flag Code and Definitions

Flag	Definition
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Data Validation Report for SP2156

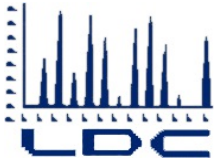
Review Questions

Method: MADEPEP (Method for the Determination of Extractable Petroleum Hydrocarbons (EPH))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Were the required minimum levels of calibration standards used in the initial calibration?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	.			
Were surrogate recoveries within project acceptance limits?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were field blanks (EBs or FBs) submitted with these samples?		.		
Were target analytes reported in the field blank(s) less than MDL?			.	
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?	.			
Were MS/MSD recoveries within project acceptance limits?	.			
Was the MS/MSD RPD within project acceptance limits?	.			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			.	
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were DoD QSM corrective actions followed if deviations were noted?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		All data acceptable as reported and qualified.

Data Validation Report for SP2156

Review Questions

Method: MADEPVP (Method for the Determination of Volatile Petroleum Hydrocarbons (VPH))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?		•		
Were target analytes reported in the field blank(s) less than MDL?			•	
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?		•		MS for o,p-DDT %R 67.5/63.5 out of limits 70-130 MSD for C5-C8 %R 66.7 out of limits 70-130 MSD for C9-C12 %R 66.5 out of limits 70-130 MS for Aroclor-1242 %R 68.3 out of limits 70-130
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		All data acceptable as reported and qualified.



LABORATORY DATA CONSULTANTS, INC.

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

August 2, 2022

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on July 11, 2022. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #54428 D:

<u>SDG #</u>	<u>Fraction</u>
SP2191	Volatile Petroleum Hydrocarbons, Extractable Petroleum Hydrocarbons

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
Project Manager/Senior Chemist
pgeng@lab-data.com

Stage 2B EQUIS EDD

LDC# 54428 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	Pest. (8151B)		Metals (6010C/20A /7470A)		VPH (MADEP -VPH)		EPH (MADEP -EPH)		Alk (2320B)		COD (410.4)		CN- (9012B)		Cl (9056A)		NO ₃ /NO ₂ -N (353.2)		SO ₄ (9056A)		TDS (2540C)																				
				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S							
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S					
A	680-215078-1	07/11/22	07/25/22	3	0	3	0	-	-	-	-	3	0	3	0	3	0	3	0	3	0	3	0	3	0																			
B	680-215136-1	07/11/22	07/25/22	2	0	2	0	-	-	-	-	2	0	2	0	2	0	2	0	2	0	2	0	2	0																			
C	SP2156	07/11/22	07/25/22	-	-	-	-	3	0	3	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-																			
D	SP2191	07/11/22	07/25/22	-	-	-	-	2	0	2	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-																			
Total				5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55

Data Validation Report for SP2191

Facility: Former Fort Devens, Long Term Monitoring
Event: Seres-Arcadis JV, Long Term Monitoring, DCL, Spring 2022
SDG: SP2191
Guidance Document: Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
Prime Contractor: Seres-Arcadis JV
Project Manager: Jennifer Singer
Contract Laboratory(ies): Katahdin Analytical Services, Westbrook, ME
Data Review Contractor: Laboratory Data Consultants Inc.
Data Review Level: 2B
Primary Data Reviewer: Long Ngo, Environmental Scientist
Second Reviewer: Pei Geng, Senior Scientist
Date Submitted: July 28, 2022

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	MADEPEP	MADEPVP
DCL-DUP01-SPR22	SP2191-2	Water	Field Duplicate/FD	X	X
LFM-99-05A-SPR22	SP2191-1	Water	Field Sample/N	X	X

Data Validation Report for SP2191

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Katahdin Analytical Services, Westbrook, ME and were reported under sample delivery group (SDG) SP2191. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Field Duplicate RPD
- Lab Blank
- LCS Recovery
- LCS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 40 results (66.67%) out of the 60 results (sample and field QC samples) reported are qualified based on review and 20 results (33.33%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Data Validation Report for SP2191

Narrative Comments

Analytical Method	Data Reviewer Comment
MADEPEP	No additional comments; see Checklist for detail.
MADEPVP	No additional comments; see Checklist for detail.



July 28, 2022

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.



August 01, 2022

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants Inc.

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Data Validation Report for SP2191

Quality Control Outliers for test method MADEPEP, Surrogate

Method performance for individual samples is demonstrated through spiking activities. All samples are spiked with surrogate compounds prior to sample preparation. The sample itself may produce effects due to such factors as interferences and high concentrations of analytes. Summary forms were evaluated and compared to electronic data deliverables. Surrogate results that were outside of the acceptance criteria are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
DCL-DUP01-SPR22 (FD)	5-alpha-Androstane	9.000	40 - 140	10 - 140	percent	J/X	I	
LFM-99-05A-SPR22 (N)	5-alpha-Androstane	11.00	40 - 140	10 - 140	percent	J/UJ	I	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Surrogate for MADEPEP

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL-DUP01-SPR22 SP2191-2	FD	2-Methylnaphthalene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Acenaphthene	1.90	1.80 U	1.80 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Acenaphthylene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Anthracene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Benzo(a)anthracene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Benzo(a)pyrene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Benzo(b)fluoranthene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Benzo(g,h,i)perylene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Benzo(k)fluoranthene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	94.0	71.0 U	71.0 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	C19-C36 Petroleum Hydrocarbons, Aliphatic	94.0	71.0 U	71.0 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	C9-C18 Petroleum Hydrocarbons, Aliphatic	94.0	71.0 U	71.0 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Chrysene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Dibenz(a,h)anthracene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Fluoranthene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Fluorene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Indeno(1,2,3-c,d)pyrene	1.90	1.40 U	1.40 X		ug/l	I

Data Validation Report for SP2191

Qualified Results associated with the Surrogate for MADEPEP

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL-DUP01-SPR22 SP2191-2	FD	Naphthalene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Phenanthrene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Pyrene	1.90	1.40 U	1.40 X		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	2-Methylnaphthalene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Acenaphthene	1.90	1.80 U	1.80 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Acenaphthylene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Anthracene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Benzo(a)anthracene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Benzo(a)pyrene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Benzo(b)fluoranthene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Benzo(g,h,i)perylene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Benzo(k)fluoranthene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	96.0	72.0 U	72.0 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	96.0	72.0 U	72.0 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	96.0	72.0 U	72.0 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Chrysene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Dibenz(a,h)anthracene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Fluoranthene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Fluorene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Indeno(1,2,3-c,d)pyrene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Naphthalene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Phenanthrene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Pyrene	1.90	1.40 U	1.40 UJ		ug/l	I

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for SP2191

Table of All Qualified Results

Test Method: MADEPEP		Extraction Method: METHOD						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL-DUP01-SPR22 SP2191-2	FD	2-Methylnaphthalene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Acenaphthene	1.90	1.80 U	1.80 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Acenaphthylene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Anthracene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Benzo(a)anthracene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Benzo(a)pyrene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Benzo(b)fluoranthene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Benzo(g,h,i)perylene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Benzo(k)fluoranthene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	94.0	71.0 U	71.0 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	C19-C36 Petroleum Hydrocarbons, Aliphatic	94.0	71.0 U	71.0 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	C9-C18 Petroleum Hydrocarbons, Aliphatic	94.0	71.0 U	71.0 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Chrysene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Dibenz(a,h)anthracene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Fluoranthene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Fluorene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Indeno(1,2,3-c,d)pyrene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Naphthalene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Phenanthrene	1.90	1.40 U	1.40 X		ug/l	I
DCL-DUP01-SPR22 SP2191-2	FD	Pyrene	1.90	1.40 U	1.40 X		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	2-Methylnaphthalene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Acenaphthene	1.90	1.80 U	1.80 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Acenaphthylene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Anthracene	1.90	1.40 U	1.40 UJ		ug/l	I

Data Validation Report for SP2191

Table of All Qualified Results

Test Method: MADEPEP		Extraction Method: METHOD						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-05A-SPR22 SP2191-1	N	Benzo(a)anthracene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Benzo(a)pyrene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Benzo(b)fluoranthene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Benzo(g,h,i)perylene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Benzo(k)fluoranthene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	96.0	72.0 U	72.0 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	96.0	72.0 U	72.0 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	96.0	72.0 U	72.0 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Chrysene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Dibenz(a,h)anthracene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Fluoranthene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Fluorene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Indeno(1,2,3-c,d)pyrene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Naphthalene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Phenanthrene	1.90	1.40 U	1.40 UJ		ug/l	I
LFM-99-05A-SPR22 SP2191-1	N	Pyrene	1.90	1.40 U	1.40 UJ		ug/l	I

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.

In instances where no LOD is provided, results are reported down to the LOQ.

Trace values are not included in the qualified results table unless additional reason codes are associated.

Data Validation Report for SP2191

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

Reason Code Definitions

Code	Definition
I	Surrogate recovery outside project limits.
TR	Trace Level Detect

Flag Code and Definitions

Flag	Definition
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Data Validation Report for SP2191

Review Questions

Method: MADEPEP (Method for the Determination of Extractable Petroleum Hydrocarbons (EPH))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?		.		HT out for LMF-99-05-SPR22RE.
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Were the required minimum levels of calibration standards used in the initial calibration?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	.			
Were surrogate recoveries within project acceptance limits?		.		Surrogate %R out for 5-alpha-androstane
Was a method blank prepared and analyzed with each batch?	.			
Were field blanks (EBs or FBs) submitted with these samples?		.		
Were target analytes reported in the field blank(s) less than MDL?			.	
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?		.		
Were MS/MSD recoveries within project acceptance limits?			.	
Was the MS/MSD RPD within project acceptance limits?			.	
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	.			
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were DoD QSM corrective actions followed if deviations were noted?	.			
Were any data recommended for rejection (exclusion) in the data validation process?	.			All data acceptable as reported and qualified with exception of surrogate 5-alpha-androstane rejection for surrogate recovery.

Data Validation Report for SP2191

Review Questions

Method: MADEPVP (Method for the Determination of Volatile Petroleum Hydrocarbons (VPH))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency and within acceptance criteria?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?		•		
Were target analytes reported in the field blank(s) less than MDL?			•	
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?		•		
Were MS/MSD recoveries within project acceptance limits?			•	
Was the MS/MSD RPD within project acceptance limits?			•	
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		All data acceptable as reported and qualified.

Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring
 Seres-Arcadis JV, Long Term Monitoring, DCL, Spring 2022
 Field Duplicates for SDG: SP2191

Location	Analysis									
LFM-99-05A	MADEPEP									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	2-Methylnaphthalene	ND	ND	1.90	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	Acenaphthene	ND	ND	1.90	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	Acenaphthylene	ND	ND	1.90	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	Anthracene	ND	ND	1.90	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	Benzo(a)anthracene	ND	ND	1.90	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	Benzo(a)pyrene	ND	ND	1.90	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	Benzo(b)fluoranthene	ND	ND	1.90	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	Benzo(g,h,i)perylene	ND	ND	1.90	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	Benzo(k)fluoranthene	ND	ND	1.90	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	ND	ND	96.0	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	C19-C36 Petroleum Hydrocarbons, Aliphatic	ND	ND	96.0	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	C9-C18 Petroleum Hydrocarbons, Aliphatic	ND	ND	96.0	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	Chrysene	ND	ND	1.90	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	Dibenz(a,h)anthracene	ND	ND	1.90	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	Fluoranthene	ND	ND	1.90	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	Fluorene	ND	ND	1.90	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	Indeno(1,2,3-c,d)pyrene	ND	ND	1.90	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	Naphthalene	ND	ND	1.90	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	Phenanthrene	ND	ND	1.90	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	Pyrene	ND	ND	1.90	NA	30	NA	OK	

FD = Field Duplicate
 RL = Reporting Limit
 RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring
 Seres-Arcadis JV, Long Term Monitoring, DCL, Spring 2022
 Field Duplicates for SDG: SP2191

Location		Analysis								
LFM-99-05A		MADEPVP								
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	Benzene	ND	ND	3.00	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	ND	ND	100	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	ND	ND	100	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	ND	ND	100	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	Ethylbenzene	ND	ND	5.00	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	m,p-Xylene	ND	ND	10.0	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	Methyl tert-butyl ether (MTBE)	ND	ND	5.00	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	Naphthalene	ND	ND	5.00	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	o-Xylene	ND	ND	5.00	NA	30	NA	OK	
LFM-99-05A-SPR22 / DCL-DUP01-SPR22	SP2191-1 / SP2191-2	Toluene	ND	ND	5.00	NA	30	NA	OK	

FD = Field Duplicate
 RL = Reporting Limit
 RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"



LABORATORY DATA CONSULTANTS, INC.

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

February 13, 2023

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on January 18, 2023. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #55942_A:

SDG #

680-224346-1

Fraction

Alkalinity, Total Dissolved Solids, Nitrogen, Nitrate-Nitrite, Chemical Oxygen Demand, Extractable Petroleum Hydrocarbons, Volatile Petroleum Hydrocarbons, Metals, Mercury, Organochlorine Pesticides, Cyanide, Anion Chromatography

The data validation was performed under Stage 2B guidelines. The analysis was validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

Stage 2B EQUIS EDD

LDC# 55942 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	VOA (8260D)		Pest. (8081B)		Metals (6010C/20A /7470A)		Fe,Mn (6010C)		Mn (6010C)		Diss. Mn (6010C)		3 D.Met. (6010C /6020A)		VPH (MADEP -VPH)		EPH (MADEP -EPH)		Alk (2320B)		COD (410.4)		CN- (9012B)		Cl (9056A)		DOC (9060A)		NO ₃ /NO ₂ -N (353.2)		SO ₄ (9056A)		TDS (2540C)					
				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S		
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-224346-1	01/18/23	02/01/23	-	-	4	0	4	0	-	-	-	-	-	-	-	-	4	0	4	0	4	0	4	0	4	0	4	0	-	-	4	0	4	0	4	0	4	0	4	0
B	680-224347-1	01/18/23	02/01/23	5	0	5	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	0	5	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	680-224673-1	01/18/23	02/01/23	-	-	-	-	-	-	-	-	-	-	1	0	9	0	-	-	8	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D	680-224679-1	01/18/23	02/01/23	-	-	-	-	-	-	5	0	1	0	-	-	-	-	5	0	-	-	5	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E	680-224679-2	01/18/23	02/01/23	-	-	-	-	-	-	-	-	-	-	-	-	1	0	-	-	-	-	1	0	-	-	-	-	1	0	1	0	-	-	4	0	-	-	-	-	-	-
F	680-224848-1	01/18/23	02/01/23	-	-	-	-	-	-	-	-	-	-	-	-	1	0	-	-	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
G	680-224848-2	01/18/23	02/01/23	-	-	-	-	-	-	-	-	-	-	-	-	8	0	-	-	-	-	8	0	-	-	-	-	8	0	8	0	-	-	8	0	-	-	-	-	-	-
Total	TR/PG			5	0	9	0	4	0	5	0	1	0	1	0	19	0	9	0	13	0	18	0	9	0	9	0	13	0	9	0	4	0	16	0	4	0	4	0	148	

Data Validation Report for 6802243461

Facility: Former Fort Devens, Long Term Monitoring
 Event: Seres-Arcadis JV, Long Term Monitoring, DCL, Fall 2022
 SDG: 6802243461
 Guidance Document: Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
 Prime Contractor: Seres-Arcadis JV
 Project Manager: Jennifer Singer
 Contract Laboratory(ies): Eurofins Environment Testing TestAmerica, Arvada, CO | Eurofins Environment Testing TestAmerica, Savannah, GA | Eurofins Spectrum Analytical, Inc., North Kingston, RI
 Data Review Contractor: Laboratory Data Consultants, Inc.
 Data Review Level: 2B
 Primary Data Reviewer: Long Ngo, Environmental Scientist
 Second Reviewer: Pei Geng, Senior Scientist
 Date Submitted: February 13, 2023

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	A2320B	A2540C	E353.2	E410.4	MADEPEP	MADEPVP	SW6010C	SW6020A	SW7470A	SW8081B	SW9012B	SW9056A
DCL-DUP01-FAL22	680-224346-1	Water	Field Duplicate/FD	X	X	X	X	X	X	X	X	X	X	X	X
LFM-99-02B-FAL22	680-224346-2	Water	Field Sample/N	X	X	X	X	X	X	X	X	X	X	X	X
LFM-99-05A-FAL22	680-224346-3	Water	Field Sample/N	X	X	X	X	X	X	X	X	X	X	X	X
LFM-99-06A-RP-FAL22	680-224346-4	Water	Field Sample/N	X	X	X	X	X	X	X	X	X	X	X	X

Data Validation Report for 6802243461

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Eurofins Environment Testing TestAmerica, Arvada, CO | Eurofins Environment Testing TestAmerica, Savannah, GA | Eurofins Spectrum Analytical, Inc., North Kingston, RI and were reported under sample delivery group (SDG) 6802243461. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Field Duplicate RPD
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 31 results (11.40%) out of the 272 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Data Validation Report for 6802243461

Narrative Comments

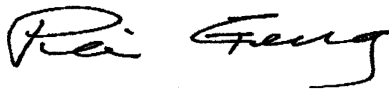
Analytical Method	Data Reviewer Comment
A2320B	No additional comments; see Checklist for detail.
A2540C	No additional comments; see Checklist for detail.
E353.2	No additional comments; see Checklist for detail.
E410.4	No additional comments; see Checklist for detail.
MADEPEP	No additional comments; see Checklist for detail.
MADEPVP	No additional comments; see Checklist for detail.
SW6010C	No additional comments; see Checklist for detail.
SW6020A	No additional comments; see Checklist for detail.
SW7470A	No additional comments; see Checklist for detail.
SW8081B	No additional comments; see Checklist for detail.
SW9012B	No additional comments; see Checklist for detail.
SW9056A	No additional comments; see Checklist for detail.



February 13, 2023

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.



February 13, 2023

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Data Validation Report for 6802243461

Quality Control Outliers for test method A2320B, LCS Recovery

The laboratory control sample/laboratory control sample duplicate (LCS/LCSD) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LCSD68074972464 (BD)	Alkalinity, Total (as CaCO3)	13.0	80 - 120	10 - 120	percent	J/UJ	C	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the LCS Recovery for A2320B

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL-DUP01-FAL22 680-224346-1	FD	Alkalinity, Total (as CaCO3)	5.00	81.0 Q	81.0 J	-	mg/l	C/Z
LFM-99-02B-FAL22 680-224346-2	N	Alkalinity, Total (as CaCO3)	5.00	120	120 J	-	mg/l	C/Z
LFM-99-05A-FAL22 680-224346-3	N	Alkalinity, Total (as CaCO3)	5.00	82.0	82.0 J	-	mg/l	C/Z
LFM-99-06A-RP-FAL22 680-224346-4	N	Alkalinity, Total (as CaCO3)	5.00	120	120 J	-	mg/l	C/Z

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802243461

Quality Control Outliers for test method E353.2, Calibration Blank

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCB28059320137 (CB)	Nitrate-Nitrite (as N)	0.0559	< 0.044	< 0.1	mg/l	U/None*	B2	
CCB68074967213 (CB)	Nitrate-Nitrite (as N)	0.0146	< 0.01	< 0.05	mg/l	U/None*	B2	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

*Blank flags displayed in the above table identify qualification of the sample result when it is less than or equal to the LOQ/RL. Sample results above the LOQ will be qualified based on the validation type such as J+ at the sample result.

No results associated with this QC element required qualification.

Data Validation Report for 6802243461

Quality Control Outliers for test method E353.2, Lab Blank

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
MB28059320122 (LB)	Nitrate-Nitrite (as N)	0.0562	< 0.044	< 0.1	mg/l	U/None*	L	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

*Blank flags displayed in the above table identify qualification of the sample result when it is less than or equal to the LOQ/RL. Sample results above the LOQ will be qualified based on the validation type such as J+ at the sample result.

No results associated with this QC element required qualification.

Data Validation Report for 6802243461

Quality Control Outliers for test method E353.2, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-FAL22 (MS)	Nitrate-Nitrite (as N)	0.00	90 - 110	10 - 110	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Nitrate-Nitrite (as N)	0.00	90 - 110	10 - 110	percent	J/X	M	Parent not found

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Data Validation Report for 6802243461

Quality Control Outliers for test method E410.4, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-FAL22 (MS)	Chemical Oxygen Demand	0.00	90 - 110	10 - 110	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Chemical Oxygen Demand	0.00	90 - 110	10 - 110	percent	J/X	M	Parent not found

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Data Validation Report for 6802243461

Quality Control Outliers for test method MADEPEP, Lab Blank

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
MB620170551B (LB)	C19-C36 Petroleum Hydrocarbons, Aliphatic	54.6	< 14	< 100	ug/l	U/None*	L	
MB620170551B (LB)	C9-C18 Petroleum Hydrocarbons, Aliphatic	40.1	< 29	< 100	ug/l	U/None*	L	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

*Blank flags displayed in the above table identify qualification of the sample result when it is less than or equal to the LOQ/RL. Sample results above the LOQ will be qualified based on the validation type such as J+ at the sample result.

Qualified Results associated with the Lab Blank for MADEPEP

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL-DUP01-FAL22 680-224346-1	FD	C19-C36 Petroleum Hydrocarbons, Aliphatic	95.0	60.0 J M B	95.0 U		ug/l	L
DCL-DUP01-FAL22 680-224346-1	FD	C9-C18 Petroleum Hydrocarbons, Aliphatic	95.0	34.0 J M	95.0 U		ug/l	L
LFM-99-02B-FAL22 680-224346-2	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	95.0	54.0 J M B	95.0 U		ug/l	L
LFM-99-02B-FAL22 680-224346-2	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	95.0	34.0 J	95.0 U		ug/l	L
LFM-99-05A-FAL22 680-224346-3	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	95.0	35.0 J M B	95.0 U		ug/l	L
LFM-99-05A-FAL22 680-224346-3	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	95.0	36.0 J	95.0 U		ug/l	L
LFM-99-06A-RP-FAL22 680-224346-4	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	95.0	46.0 J M B	95.0 U		ug/l	L
LFM-99-06A-RP-FAL22 680-224346-4	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	95.0	37.0 J	95.0 U		ug/l	L

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802243461

Quality Control Outliers for test method MADEPEP, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-FAL22 (MS)	2-Methylnaphthalene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	2-Methylnaphthalene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Acenaphthene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Acenaphthene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Acenaphthylene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Acenaphthylene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Anthracene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Anthracene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Benzo (a)anthracene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Benzo (a)anthracene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Benzo(a)pyrene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Benzo(a)pyrene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Benzo (b)fluoranthene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Benzo (b)fluoranthene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Benzo (g,h,i)perylene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Benzo (g,h,i)perylene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Benzo (k)fluoranthene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Benzo (k)fluoranthene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	C19-C36 Petroleum Hydrocarbons, Aliphatic	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	C19-C36 Petroleum Hydrocarbons, Aliphatic	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	C9-C18 Petroleum Hydrocarbons, Aliphatic	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	C9-C18 Petroleum Hydrocarbons, Aliphatic	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Chrysene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Chrysene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Dibenz (a,h)anthracene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found

Data Validation Report for 6802243461

Quality Control Outliers for test method MADEPEP, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-FAL22 (SD)	Dibenz (a,h)anthracene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Fluoranthene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Fluoranthene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Fluorene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Fluorene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Indeno(1,2,3- c,d)pyrene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Indeno(1,2,3- c,d)pyrene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Naphthalene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Naphthalene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Phenanthrene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Phenanthrene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Pyrene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Pyrene	0.00	40 - 140	10 - 140	percent	J/X	M	Parent not found

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the MS Recovery for MADEPEP

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-FAL22 680-224346-2	N	Naphthalene	4.80	1.40 U M J1	1.40 UJ		ug/l	M

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802243461

Quality Control Outliers for test method MADEPVP, Lab Blank

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
MB620171886 (LB)	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	10.2	< 0.55	< 100	ug/l	U/None*	L	
MB620171886 (LB)	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	10.4	< 0.85	< 100	ug/l	U/None*	L	
MB620171886 (LB)	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	2.09	< 1.9	< 100	ug/l	U/None*	L	
MB620172326 (LB)	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	9.12	< 0.55	< 100	ug/l	U/None*	L	
MB620172326 (LB)	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	10.8	< 0.85	< 100	ug/l	U/None*	L	
MB620172326 (LB)	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	2.72	< 1.9	< 100	ug/l	U/None*	L	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

*Blank flags displayed in the above table identify qualification of the sample result when it is less than or equal to the LOQ/RL. Sample results above the LOQ will be qualified based on the validation type such as J+ at the sample result.

Qualified Results associated with the Lab Blank for MADEPVP

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL-DUP01-FAL22 680-224346-1	FD	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	9.70 J	100 U		ug/l	L

Data Validation Report for 6802243461

Qualified Results associated with the Lab Blank for MADEPVP

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL-DUP01-FAL22 680-224346-1	FD	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	100	12.0 J	100 U		ug/l	L
LFM-99-02B-FAL22 680-224346-2	N	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	7.00 J	100 U		ug/l	L
LFM-99-02B-FAL22 680-224346-2	N	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	100	11.0 J	100 U		ug/l	L
LFM-99-02B-FAL22 680-224346-2	N	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	2.50 J	100 U		ug/l	L
LFM-99-05A-FAL22 680-224346-3	N	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	7.30 J	100 U		ug/l	L
LFM-99-05A-FAL22 680-224346-3	N	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	100	10.0 J	100 U		ug/l	L
LFM-99-06A-RP-FAL22 680-224346-4	N	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	6.70 J	100 U		ug/l	L
LFM-99-06A-RP-FAL22 680-224346-4	N	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	100	12.0 J	100 U		ug/l	L

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802243461

Quality Control Outliers for test method MADEPVP, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-FAL22 (MS)	Benzene	0.00	70 - 130	10 - 130	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Benzene	0.00	70 - 130	10 - 130	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	0.00	70 - 130	10 - 130	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	0.00	70 - 130	10 - 130	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Ethylbenzene	0.00	70 - 130	10 - 130	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Ethylbenzene	0.00	70 - 130	10 - 130	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	m,p-Xylene	0.00	70 - 130	10 - 130	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	m,p-Xylene	0.00	70 - 130	10 - 130	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Methyl tert-butyl ether (MTBE)	0.00	70 - 130	10 - 130	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Methyl tert-butyl ether (MTBE)	0.00	70 - 130	10 - 130	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Naphthalene	0.00	70 - 130	10 - 130	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Naphthalene	0.00	70 - 130	10 - 130	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	o-Xylene	0.00	70 - 130	10 - 130	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	o-Xylene	0.00	70 - 130	10 - 130	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Toluene	0.00	70 - 130	10 - 130	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Toluene	0.00	70 - 130	10 - 130	percent	J/X	M	Parent not found

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Data Validation Report for 6802243461

Quality Control Outliers for test method SW6010C, Total, Calibration Blank

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCB68074879982 (CB)	Barium	3.19	< 1.7	< 10	ug/l	U/None*	B2	
CCB68074879982 (CB)	Cadmium	2.82	< 1	< 5	ug/l	U/None*	B2	
CCB68074879982 (CB)	Chromium	3.39	< 1.6	< 10	ug/l	U/None*	B2	
CCB68074879982 (CB)	Copper	3.17	< 1.8	< 20	ug/l	U/None*	B2	
CCB68074879982 (CB)	Manganese	3.42	< 1	< 10	ug/l	U/None*	B2	
CCB68074879982 (CB)	Silver	1.95	< 0.6	< 10	ug/l	U/None*	B2	
CCB68074879994 (CB)	Barium	3.33	< 1.7	< 10	ug/l	U/None*	B2	
CCB68074879994 (CB)	Cadmium	3.61	< 1	< 5	ug/l	U/None*	B2	
CCB68074879994 (CB)	Chromium	4.19	< 1.6	< 10	ug/l	U/None*	B2	
CCB68074879994 (CB)	Copper	4.17	< 1.8	< 20	ug/l	U/None*	B2	
CCB68074879994 (CB)	Manganese	3.75	< 1	< 10	ug/l	U/None*	B2	
CCB68074879994 (CB)	Silver	2.81	< 0.6	< 10	ug/l	U/None*	B2	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

*Blank flags displayed in the above table identify qualification of the sample result when it is less than or equal to the LOQ/RL. Sample results above the LOQ will be qualified based on the validation type such as J+ at the sample result.

Qualified Results associated with the Calibration Blank for SW6010C, Total

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL-DUP01-FAL22 680-224346-1	FD	Manganese	10.0	2.90 J	10.0 U		ug/l	B2
LFM-99-02B-FAL22 680-224346-2	N	Barium	20.0	6.60 J	20.0 U		ug/l	B2
LFM-99-02B-FAL22 680-224346-2	N	Manganese	10.0	2.30 J	10.0 U		ug/l	B2
LFM-99-06A-RP-FAL22 680-224346-4	N	Barium	20.0	5.80 J	20.0 U		ug/l	B2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802243461

Quality Control Outliers for test method SW6010C, Total, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-FAL22 (MS)	Barium	0.00	88 - 113	10 - 125	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Barium	0.00	88 - 113	10 - 125	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Cadmium	0.00	88 - 113	10 - 125	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Cadmium	0.00	88 - 113	10 - 125	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Chromium	0.00	90 - 113	10 - 125	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Chromium	0.00	90 - 113	10 - 125	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Iron	0.00	87 - 115	10 - 125	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Iron	0.00	87 - 115	10 - 125	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Lead	0.00	86 - 113	10 - 125	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Lead	0.00	86 - 113	10 - 125	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Manganese	0.00	90 - 114	10 - 125	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Manganese	0.00	90 - 114	10 - 125	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Selenium	0.00	83 - 114	10 - 125	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Selenium	0.00	83 - 114	10 - 125	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Silver	0.00	84 - 115	10 - 125	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Silver	0.00	84 - 115	10 - 125	percent	J/X	M	Parent not found

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Data Validation Report for 6802243461

Quality Control Outliers for test method SW6020A, Total, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-FAL22 (MS)	Arsenic	0.00	84 - 116	10 - 125	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Arsenic	0.00	84 - 116	10 - 125	percent	J/X	M	Parent not found

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Data Validation Report for 6802243461

Quality Control Outliers for test method SW7470A, Total, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-FAL22 (MS)	Mercury	0.00	80 - 124	10 - 124	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Mercury	0.00	80 - 124	10 - 124	percent	J/X	M	Parent not found

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Data Validation Report for 6802243461

Quality Control Outliers for test method SW8081B, Continuing Calibration Verification

Compliance requirements for satisfactory continuing calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data. Continuing calibration is performed to verify and evaluate instrument performance during sample analysis. Summary forms were evaluated against project acceptance criteria, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCV68074907534 (CV)	Heptachlor	79.0	80 - 120	80 - 120	percent	J/UJ	V2	
CCVIS6807490753 (CV)	Endrin	123	80 - 120	80 - 120	percent	J/None	V2	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Continuing Calibration Verification for SW8081B

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL-DUP01-FAL22 680-224346-1	FD	Heptachlor	0.0520	0.00420 U Q	0.00420 UJ		ug/l	V2
LFM-99-02B-FAL22 680-224346-2	N	Heptachlor	0.0470	0.00370 U Q	0.00370 UJ		ug/l	V2
LFM-99-05A-FAL22 680-224346-3	N	Heptachlor	0.0460	0.00370 U Q	0.00370 UJ		ug/l	V2
LFM-99-06A-RP-FAL22 680-224346-4	N	Heptachlor	0.0460	0.00360 U Q	0.00360 UJ		ug/l	V2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802243461

Quality Control Outliers for test method SW8081B, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-FAL22 (MS)	Aldrin	0.00	45 - 134	10 - 134	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Aldrin	0.00	45 - 134	10 - 134	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	alpha-BHC (alpha-Hexachlorocyclohexane)	0.00	54 - 138	10 - 138	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	alpha-BHC (alpha-Hexachlorocyclohexane)	0.00	54 - 138	10 - 138	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	alpha-Endosulfan	0.00	62 - 126	10 - 126	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	alpha-Endosulfan	0.00	62 - 126	10 - 126	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	beta-BHC (beta-Hexachlorocyclohexane)	0.00	56 - 136	10 - 136	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	beta-BHC (beta-Hexachlorocyclohexane)	0.00	56 - 136	10 - 136	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	beta-Endosulfan	0.00	52 - 135	10 - 135	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	beta-Endosulfan	0.00	52 - 135	10 - 135	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	delta-BHC (delta-Hexachlorocyclohexane)	0.00	52 - 142	10 - 142	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	delta-BHC (delta-Hexachlorocyclohexane)	0.00	52 - 142	10 - 142	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Dieldrin	0.00	60 - 136	10 - 136	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Dieldrin	0.00	60 - 136	10 - 136	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Endosulfan sulfate	0.00	62 - 133	10 - 133	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Endosulfan sulfate	0.00	62 - 133	10 - 133	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Endrin	0.00	60 - 138	10 - 138	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Endrin	0.00	60 - 138	10 - 138	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Endrin aldehyde	0.00	51 - 132	10 - 132	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Endrin aldehyde	0.00	51 - 132	10 - 132	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Endrin ketone	0.00	58 - 134	10 - 134	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Endrin ketone	0.00	58 - 134	10 - 134	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	gamma-BHC (Lindane)	0.00	59 - 134	10 - 134	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	gamma-BHC (Lindane)	0.00	59 - 134	10 - 134	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Heptachlor	0.00	54 - 130	10 - 130	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Heptachlor	0.00	54 - 130	10 - 130	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Heptachlor epoxide	0.00	61 - 133	10 - 133	percent	J/X	M	Parent not found

Data Validation Report for 6802243461

Quality Control Outliers for test method SW8081B, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-FAL22 (SD)	Heptachlor epoxide	0.00	61 - 133	10 - 133	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Methoxychlor	0.00	54 - 145	10 - 145	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Methoxychlor	0.00	54 - 145	10 - 145	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	p,p'-DDD	0.00	56 - 143	10 - 143	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	p,p'-DDD	0.00	56 - 143	10 - 143	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	p,p'-DDE	0.00	57 - 135	10 - 135	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	p,p'-DDE	0.00	57 - 135	10 - 135	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	p,p'-DDT	0.00	51 - 143	10 - 143	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	p,p'-DDT	0.00	51 - 143	10 - 143	percent	J/X	M	Parent not found

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

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Quality Control Outliers for test method SW9012B, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-FAL22 (MS)	Cyanide	0.00	83 - 116	10 - 116	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Cyanide	0.00	83 - 116	10 - 116	percent	J/X	M	Parent not found

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

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Quality Control Outliers for test method SW9056A, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LFM-99-02B-FAL22 (MS)	Chloride	0.00	90 - 110	10 - 110	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Chloride	0.00	90 - 110	10 - 110	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (MS)	Sulfate	0.00	90 - 110	10 - 110	percent	J/X	M	Parent not found
LFM-99-02B-FAL22 (SD)	Sulfate	0.00	90 - 110	10 - 110	percent	J/X	M	Parent not found

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Data Validation Report for 6802243461

Table of All Qualified Results

Test Method: A2320B		Extraction Method: NONE						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL-DUP01-FAL22 680-224346-1	FD	Alkalinity, Total (as CaCO3)	5.00	81.0 Q	81.0 J	-	mg/l	C/Z
LFM-99-02B-FAL22 680-224346-2	N	Alkalinity, Total (as CaCO3)	5.00	120	120 J	-	mg/l	C/Z
LFM-99-05A-FAL22 680-224346-3	N	Alkalinity, Total (as CaCO3)	5.00	82.0	82.0 J	-	mg/l	C/Z
LFM-99-06A-RP-FAL22 680-224346-4	N	Alkalinity, Total (as CaCO3)	5.00	120	120 J	-	mg/l	C/Z
Test Method: MADEPEP		Extraction Method: SW3510C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL-DUP01-FAL22 680-224346-1	FD	C19-C36 Petroleum Hydrocarbons, Aliphatic	95.0	60.0 J M B	95.0 U		ug/l	L
DCL-DUP01-FAL22 680-224346-1	FD	C9-C18 Petroleum Hydrocarbons, Aliphatic	95.0	34.0 J M	95.0 U		ug/l	L
LFM-99-02B-FAL22 680-224346-2	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	95.0	54.0 J M B	95.0 U		ug/l	L
LFM-99-02B-FAL22 680-224346-2	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	95.0	34.0 J	95.0 U		ug/l	L
LFM-99-02B-FAL22 680-224346-2	N	Naphthalene	4.80	1.40 U M J1	1.40 UJ		ug/l	M
LFM-99-05A-FAL22 680-224346-3	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	95.0	35.0 J M B	95.0 U		ug/l	L
LFM-99-05A-FAL22 680-224346-3	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	95.0	36.0 J	95.0 U		ug/l	L
LFM-99-06A-RP-FAL22 680-224346-4	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	95.0	46.0 J M B	95.0 U		ug/l	L
LFM-99-06A-RP-FAL22 680-224346-4	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	95.0	37.0 J	95.0 U		ug/l	L
Test Method: MADEPVP		Extraction Method: SW5030C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL-DUP01-FAL22 680-224346-1	FD	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	9.70 J	100 U		ug/l	L
DCL-DUP01-FAL22 680-224346-1	FD	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	100	12.0 J	100 U		ug/l	L
LFM-99-02B-FAL22 680-224346-2	N	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	7.00 J	100 U		ug/l	L
LFM-99-02B-FAL22 680-224346-2	N	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	100	11.0 J	100 U		ug/l	L
LFM-99-02B-FAL22 680-224346-2	N	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	2.50 J	100 U		ug/l	L

Data Validation Report for 6802243461

Table of All Qualified Results

Test Method: MADEPVP		Extraction Method: SW5030C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-05A-FAL22 680-224346-3	N	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	7.30 J	100 U		ug/l	L
LFM-99-05A-FAL22 680-224346-3	N	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	100	10.0 J	100 U		ug/l	L
LFM-99-06A-RP-FAL22 680-224346-4	N	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	6.70 J	100 U		ug/l	L
LFM-99-06A-RP-FAL22 680-224346-4	N	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	100	12.0 J	100 U		ug/l	L
Test Method: SW6010C		Extraction Method: TOTREC						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL-DUP01-FAL22 680-224346-1	FD	Manganese	10.0	2.90 J	10.0 U		ug/l	B2
LFM-99-02B-FAL22 680-224346-2	N	Barium	20.0	6.60 J	20.0 U		ug/l	B2
LFM-99-02B-FAL22 680-224346-2	N	Manganese	10.0	2.30 J	10.0 U		ug/l	B2
LFM-99-06A-RP-FAL22 680-224346-4	N	Barium	20.0	5.80 J	20.0 U		ug/l	B2
Test Method: SW8081B		Extraction Method: SW3510C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL-DUP01-FAL22 680-224346-1	FD	Heptachlor	0.0520	0.00420 U Q	0.00420 UJ		ug/l	V2
LFM-99-02B-FAL22 680-224346-2	N	Heptachlor	0.0470	0.00370 U Q	0.00370 UJ		ug/l	V2
LFM-99-05A-FAL22 680-224346-3	N	Heptachlor	0.0460	0.00370 U Q	0.00370 UJ		ug/l	V2
LFM-99-06A-RP-FAL22 680-224346-4	N	Heptachlor	0.0460	0.00360 U Q	0.00360 UJ		ug/l	V2
Test Method: SW9012B		Extraction Method: METHOD						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LFM-99-02B-FAL22 680-224346-2	N	Cyanide	0.0100	0.00640 J J1	0.00640 J		mg/l	D/TR

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
 In instances where no LOD is provided, results are reported down to the LOQ.
 Trace values are not included in the qualified results table unless additional reason codes are associated.

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Table of Results with Modified Qualifiers

Modified Qualifiers for test method A2320B

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
DCL-DUP01-FAL22 680-224346-1	FD	Alkalinity, Total (as CaCO3)	5.00	81.0 Q	81.0 J	81.0 J	C/Z
LFM-99-02B-FAL22 680-224346-2	N	Alkalinity, Total (as CaCO3)	5.00	120	120 J	120 J	C/Z
LFM-99-05A-FAL22 680-224346-3	N	Alkalinity, Total (as CaCO3)	5.00	82.0	82.0 J	82.0 J	C/Z
LFM-99-06A-RP-FAL22 680-224346-4	N	Alkalinity, Total (as CaCO3)	5.00	120	120 J	120 J	C/Z

Modified Qualifiers for test method MADEPEP

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
LFM-99-02B-FAL22 680-224346-2	N	Naphthalene	4.80	1.40 U M J1	1.40 U	1.40 UJ	M

Modified Qualifiers for test method SW6010C

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
DCL-DUP01-FAL22 680-224346-1	FD	Barium	20.0	23.0	23.0 J	23.0	
LFM-99-05A-FAL22 680-224346-3	N	Barium	20.0	21.0	21.0 J	21.0	

Modified Qualifiers for test method SW9012B

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
LFM-99-02B-FAL22 680-224346-2	N	Cyanide	0.0100	0.00640 J J1	0.00640 J	0.00640 J	D/TR

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
 In instances where no LOD is provided, results are reported down to the LOQ.
 Trace values are not included in the qualified results table unless additional reason codes are associated.

Reason Code Definitions

Code	Definition
B2	CCB
C	LCS Recovery
D	MS RPD
L	Lab Blank
M	MS Recovery
TR	Trace Level Detect
V2	CCV
Z	LCS RPD

Flag Code and Definitions

Flag	Definition
J	Estimated Value

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N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

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Review Questions

Method: A2320B (Alkalinity by Titrimetric Method)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?			.	Not applicable to this method.
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?			.	Not applicable to this method.
Were all reported analytes for the ICV within the required criteria?			.	Not applicable to this method.
Were ICB/CCBs run at the required frequency?			.	Not applicable to this method.
Were target analytes in the ICBs/CCBs non-detect?			.	Not applicable to this method.
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?	.			
Were field blanks (EBs or FBs) submitted with these samples?			.	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			.	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?		.		Several results qualified J- due to LCS/LCSD %R being lower than %R limits.
Was the LCS/LCSD RPD within project acceptance limits?		.		Several results qualified J due to LCS/LCSD RPD being greater than RPD limits.
Was a MS/MSD pair prepared with each batch?			.	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			.	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			.	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	.			
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		Data acceptable as reported and qualified.

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Review Questions

Method: A2540C (Total Dissolved Solids, Dried at 180 C)

Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Data Validation Report for 6802243461

Review Questions

Method: E353.2 (Nitrogen, Nitrate-Nitrite (Colorimetric Automated, Cadmium Reduction))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?		•		Analytes detected in the CCB but no results were qualified.
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?		•		Analytes detected in the method blank but no results were qualified.
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			%R could not be calculated by ADR due to parent sample not being assigned. MS/MSD were reviewed manually in laboratory report and found to be in control. No results were qualified.
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

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Review Questions

Method: E410.4 (Chemical Oxygen Demand (Colorimetric, Automated Manual))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency?	.			
Were target analytes in the ICBs/CCBs non-detect?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?	.			
Were field blanks (EBs or FBs) submitted with these samples?			.	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			.	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?	.			
Were MS/MSD recoveries within project acceptance limits?	.			%R could not be calculated by ADR due to parent sample not being assigned. MS/MSD were reviewed manually in laboratory report and found to be in control. No results were qualified.
Was the MS/MSD RPD within project acceptance limits?	.			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	.			
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		Data acceptable as reported and qualified.

Data Validation Report for 6802243461

Review Questions

Method: MADEPEP (Method for the Determination of Extractable Petroleum Hydrocarbons (EPH))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?		•		Several results qualified U at the LOQ due to method blank contamination.
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?		•		One result qualified UJ due to MS/MSD %R being lower than %R limits. %R could not be calculated by ADR due to parent sample not being assigned. MS/MSD were reviewed manually in laboratory report and one result found to be not in control.
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Data Validation Report for 6802243461

Review Questions

Method: MADEPVP (Method for the Determination of Volatile Petroleum Hydrocarbons (VPH))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Were the required minimum levels of calibration standards used in the initial calibration?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency?	.			
Were target analytes in the ICBs/CCBs non-detect?	.			
Were surrogate recoveries within project acceptance limits?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?		.		Several results qualified U at the LOQ due to method blank contamination.
Were field blanks (EBs or FBs) submitted with these samples?			.	Not applicable to this method
Were target analytes reported in the field blank(s) less than MDL?			.	Not applicable to this method
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?	.			
Were MS/MSD recoveries within project acceptance limits?	.			%R could not be calculated by ADR due to parent sample not being assigned. MS/MSD were reviewed manually in laboratory report and found to be in control. No results were qualified.
Was the MS/MSD RPD within project acceptance limits?	.			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	.			
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were DoD QSM corrective actions followed if deviations were noted?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		Data acceptable as reported and qualified.

Data Validation Report for 6802243461

Review Questions

Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency?	.			
Were target analytes in the ICBs/CCBs non-detect?		.		Several results qualified U at concentration due to method blank contamination.
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?	.			
Were field blanks (EBs or FBs) submitted with these samples?			.	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			.	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?	.			
Were MS/MSD recoveries within project acceptance limits?	.			%R could not be calculated by ADR due to parent sample not being assigned. MS/MSD were reviewed manually in laboratory report and found to be in control. No results were qualified.
Was the MS/MSD RPD within project acceptance limits?	.			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	.			
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		Data acceptable as reported and qualified.

Data Validation Report for 6802243461

Review Questions

Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?				
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			%R could not be calculated by ADR due to parent sample not being assigned. MS/MSD were reviewed manually in laboratory report and found to be in control. No results were qualified.
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Data Validation Report for 6802243461

Review Questions

Method: SW7470A (Mercury in Water (Manual Cold-Vapor Technique))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			%R could not be calculated by ADR due to parent sample not being assigned. MS/MSD were reviewed manually in laboratory report and found to be in control. No results were qualified.
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Data Validation Report for 6802243461

Review Questions

Method: SW8081B (Organochlorine Pesticides by Capillary GC)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?		.		Several results qualified UJ due to CCV %D being greater than 20%.
Were the required minimum levels of calibration standards used in the initial calibration?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency?	.			
Were target analytes in the ICBs/CCBs non-detect?	.			
Were surrogate recoveries within project acceptance limits?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?	.			
Were field blanks (EBs or FBs) submitted with these samples?			.	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			.	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?	.			
Were MS/MSD recoveries within project acceptance limits?	.			%R could not be calculated by ADR due to parent sample not being assigned. MS/MSD were reviewed manually in laboratory report and found to be in control. No results were qualified.
Was the MS/MSD RPD within project acceptance limits?	.			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	.			
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were DoD QSM corrective actions followed if deviations were noted?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		Data acceptable as reported and qualified.

Data Validation Report for 6802243461

Review Questions

Method: SW9012B (Total and Amenable Cyanide (Automated Colorimetric, with Off-Line Distillation))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency?	.			
Were target analytes in the ICBs/CCBs non-detect?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?	.			
Were field blanks (EBs or FBs) submitted with these samples?			.	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			.	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?	.			
Were MS/MSD recoveries within project acceptance limits?	.			%R could not be calculated by ADR due to parent sample not being assigned. MS/MSD were reviewed manually in laboratory report and found to be in control. No results were qualified.
Was the MS/MSD RPD within project acceptance limits?		.		One result qualified J due to MS/MSD RPD being greater than RPD limits.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	.			
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		Data acceptable as reported and qualified

Data Validation Report for 6802243461

Review Questions

Method: SW9056A (Anion Chromatography)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			%R could not be calculated by ADR due to parent sample not being assigned. MS/MSD were reviewed manually in laboratory report and found to be in control. No results were qualified.
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, DCL, Fall 2022
Field Duplicates for SDG: 6802243461

Location	Analysis									
LFM-99-05A	A2320B									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Alkalinity, Total (as CaCO3)	82.0	81.0	5.00	1.23	30	OK	NA	

Location	Analysis									
LFM-99-05A	A2540C									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Total Dissolved Solids	610	620	10.0	1.63	30	OK	NA	

Location	Analysis									
LFM-99-05A	E353.2									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Nitrate-Nitrite (as N)	0.330	0.460	0.0500	32.9	30	NA	0.13	

Location	Analysis									
LFM-99-05A	E410.4									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Chemical Oxygen Demand	16.0	17.0	20.0	6.06	30	NA	OK	

Location	Analysis									
LFM-99-05A	MADEPEP									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	2-Methylnaphthalene	ND	ND	4.80	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Acenaphthene	ND	ND	4.80	NA	30	NA	OK	

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring
 Seres-Arcadis JV, Long Term Monitoring, DCL, Fall 2022
 Field Duplicates for SDG: 6802243461

Location	Analysis									
LFM-99-05A	MADEPEP									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Acenaphthylene	ND	ND	4.80	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Anthracene	ND	ND	4.80	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Benzo(a)anthracene	ND	ND	4.80	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Benzo(a)pyrene	ND	ND	4.80	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Benzo(b)fluoranthene	ND	ND	4.80	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Benzo(g,h,i)perylene	ND	ND	4.80	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Benzo(k)fluoranthene	ND	ND	4.80	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	ND	ND	95.0	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	C19-C36 Petroleum Hydrocarbons, Aliphatic	ND	ND	95.0	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	C9-C18 Petroleum Hydrocarbons, Aliphatic	ND	ND	95.0	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Chrysene	ND	ND	4.80	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Dibenz(a,h)anthracene	ND	ND	4.80	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Fluoranthene	ND	ND	4.80	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Fluorene	ND	ND	4.80	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Indeno(1,2,3-c,d)pyrene	ND	ND	4.80	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Naphthalene	ND	ND	4.80	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Phenanthrene	ND	ND	4.80	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Pyrene	ND	ND	4.80	NA	30	NA	OK	

FD = Field Duplicate
 RL = Reporting Limit
 RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, DCL, Fall 2022
Field Duplicates for SDG: 6802243461

Location		Analysis								
LFM-99-05A		MADEPVP								
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Benzene	ND	ND	5.00	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	ND	ND	100	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	ND	ND	100	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	ND	ND	100	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Ethylbenzene	ND	ND	5.00	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	m,p-Xylene	ND	ND	10.0	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Methyl tert-butyl ether (MTBE)	ND	ND	5.00	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Naphthalene	ND	ND	5.00	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	o-Xylene	ND	ND	5.00	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Toluene	ND	ND	5.00	NA	30	NA	OK	

Location: LFM-99-05A
Analysis: SW6010C

Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Barium (TOTREC)	21.0	23.0	20.0	9.09	30	NA	OK
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Cadmium (TOTREC)	ND	ND	5.00	NA	30	NA	OK
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Chromium (TOTREC)	ND	ND	10.0	NA	30	NA	OK
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Copper (TOTREC)	ND	ND	20.0	NA	30	NA	OK
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Iron (TOTREC)	ND	ND	100	NA	30	NA	OK

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring
 Seres-Arcadis JV, Long Term Monitoring, DCL, Fall 2022
 Field Duplicates for SDG: 6802243461

Location	Analysis									
LFM-99-05A	SW6010C									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Lead (TOTREC)	ND	ND	40.0	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Manganese (TOTREC)	ND	ND	10.0	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Selenium (TOTREC)	ND	ND	25.0	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Silver (TOTREC)	ND	ND	10.0	NA	30	NA	OK	

Location	Analysis									
LFM-99-05A	SW6020A									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Arsenic (TOTREC)	1.20	ND	5.00	NA	30	NA	OK	

Location	Analysis									
LFM-99-05A	SW7470A									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Mercury (TOTAL)	ND	ND	0.250	NA	30	NA	OK	

Location	Analysis									
LFM-99-05A	SW8081B									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Aldrin	ND	ND	0.0460	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	alpha-BHC (alpha-Hexachlorocyclohexane)	ND	ND	0.0460	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	alpha-Endosulfan	ND	ND	0.0460	NA	30	NA	OK	

FD = Field Duplicate
 RL = Reporting Limit
 RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, DCL, Fall 2022
Field Duplicates for SDG: 6802243461

Location	Analysis									
LFM-99-05A	SW8081B									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	beta-BHC (beta-Hexachlorocyclohexane)	ND	ND	0.0460	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	beta-Endosulfan	ND	ND	0.0460	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Chlordane	ND	ND	0.460	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	delta-BHC (delta-Hexachlorocyclohexane)	ND	ND	0.0460	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Dieldrin	ND	ND	0.0460	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Endosulfan sulfate	ND	ND	0.0460	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Endrin	ND	ND	0.0460	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Endrin aldehyde	ND	ND	0.0460	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Endrin ketone	ND	ND	0.0460	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	gamma-BHC (Lindane)	ND	ND	0.0460	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Heptachlor	ND	ND	0.0460	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Heptachlor epoxide	ND	ND	0.0460	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Methoxychlor	ND	ND	0.0460	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	p,p'-DDD	ND	ND	0.0460	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	p,p'-DDE	ND	ND	0.0460	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	p,p'-DDT	ND	ND	0.0460	NA	30	NA	OK	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Toxaphene	ND	ND	4.60	NA	30	NA	OK	

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, DCL, Fall 2022
Field Duplicates for SDG: 6802243461

Location	Analysis									
LFM-99-05A	SW9012B									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Cyanide	ND	0.0120	0.0100	NA	30	NA	0.012	

Location	Analysis									
LFM-99-05A	SW9056A									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Chloride	270	280	1.00	3.64	30	OK	NA	
LFM-99-05A-FAL22 / DCL-DUP01-FAL22	680-224346-3 / 680-224346-1	Sulfate	16.0	14.0	2.00	13.3	30	NA	OK	

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"



LABORATORY DATA CONSULTANTS, INC.

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

March 1, 2023

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on December 14, 2022. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #55565_RV1:

SDG #

680-224348-1/680-224348-2

Fraction

Total Suspended Solids, Volatiles, Extractable Priority Pollutants, Diesel Range Organics, Metals, Mercury, Organochlorine Pesticides, Total and Amenable Cyanide, pH, Polychlorinated Biphenyls

The data validation was performed under Stage 2B guidelines. The analysis was validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

Data Validation Report for 6802243481

Facility: Former Fort Devens, Long Term Monitoring
 Event: Seres-Arcadis JV, Long Term Monitoring, DCL Leach, Fall 2022
 SDG: 6802243481
 Guidance Document: Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
 Prime Contractor: Seres-Arcadis JV
 Project Manager: Jennifer Singer
 Contract Laboratory(ies): Eurofins Environment Testing TestAmerica, Arvada, CO | Eurofins Environment Testing TestAmerica, Savannah, GA
 Data Review Contractor: Laboratory Data Consultants, Inc.
 Data Review Level: 2B
 Primary Data Reviewer: Long Ngo, Environmental Scientist
 Second Reviewer: Pei Geng, Senior Scientist
 Date Submitted: February 08, 2023

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	A2540D	E624	E625	M8015D	SW6010C	SW6020A	SW7470A	SW8081B	SW9012B	SW9040C	SW9065
DCL LEACHATE-FAL22	680-224348-1	Liquid	Field Sample/N	X	X	X	X	X	X	X	X	X	X	X

Data Validation Report for 6802243481

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Eurofins Environment Testing TestAmerica, Arvada, CO | Eurofins Environment Testing TestAmerica, Savannah, GA and were reported under sample delivery group (SDG) 6802243481. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- LCS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 55 results (41.98%) out of the 131 results (sample and field QC samples) reported are qualified based on review and 10 results (7.63%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Data Validation Report for 6802243481

Narrative Comments

Analytical Method	Data Reviewer Comment
A2540D	No additional comments; see Checklist for detail.
E624	No additional comments; see Checklist for detail.
E625	No additional comments; see Checklist for detail.
M8015D	No additional comments; see Checklist for detail.
SW6010C	No additional comments; see Checklist for detail.
SW6020A	No additional comments; see Checklist for detail.
SW7470A	No additional comments; see Checklist for detail.
SW8081B	No additional comments; see Checklist for detail.
SW9012B	No additional comments; see Checklist for detail.
SW9040C	No additional comments; see Checklist for detail.
SW9065	No additional comments; see Checklist for detail.



February 08, 2023

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.



March 01, 2023

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Data Validation Report for 6802243481

Quality Control Outliers for test method E624, Lab Blank

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
MB2805930047 (LB)	Methylene chloride	1.08	< 0.94	< 2	ug/l	U/None*	L	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

*Blank flags displayed in the above table identify qualification of the sample result when it is less than or equal to the LOQ/RL. Sample results above the LOD or LOQ will be qualified based on the validation guidance assigned in the project setup.

No results associated with this QC element required qualification.

Data Validation Report for 6802243481

Quality Control Outliers for test method E625, LCS Recovery

The laboratory control sample/laboratory control sample duplicate (LCS/LCSD) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LCSD2805925923A (BD)	1,3-Dichlorobenzene	64.0	70 - 129	70 - 129	percent	J/UJ	C	
LCSD2805925923A (BD)	Hexachloroethane	64.0	68 - 128	68 - 128	percent	J/UJ	C	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the LCS Recovery for E625

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL LEACHATE-FAL22 680-224348-1	N	1,3-Dichlorobenzene	200	160 U H	160 UJ		ug/l	C/H2
DCL LEACHATE-FAL22 680-224348-1	N	Hexachloroethane	200	160 U H	160 UJ		ug/l	C/H2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802243481

Quality Control Outliers for test method E625, Prep Hold Time

Hold times are ascertained based on project requirements. Holding times were determined by comparing the chain of custody records with the dates of extraction found in the electronic data deliverable and laboratory summary forms. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
DCL LEACHATE-FAL22 (N)		11.1	< 7	< 14	days	J/X	H2	Prep Exceeds UWL

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Prep Hold Time for E625

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL LEACHATE-FAL22 680-224348-1	N	1,2,4-Trichlorobenzene	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	1,2-Dichlorobenzene	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	1,3-Dichlorobenzene	200	160 U H	160 UJ		ug/l	C/H2
DCL LEACHATE-FAL22 680-224348-1	N	1,4-Dichlorobenzene	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	2,2'-Oxybis(1- chloropropane)	200	160 U H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	2,4,6-Trichlorophenol	200	160 U H	160 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	2,4-Dichlorophenol	200	160 U H	160 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	2,4-Dimethylphenol	200	160 U H	160 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	2-Chloronaphthalene	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	2-Chlorophenol	200	160 U H	160 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	2-Nitrophenol	200	160 U H	160 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	3,3'-Dichlorobenzidine	1000	600 U H Q	600 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	4,6-Dinitro-2-methylphenol	1000	600 U H	600 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	4-Bromophenyl phenyl ether	200	160 U H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	4-Chloro-3-methylphenol	200	160 U H	160 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	4-Chlorophenyl phenyl ether	200	160 U H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	4-Nitrophenol	200	180 U M H	180 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	Acenaphthene	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Acenaphthylene	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Anthracene	80.0	64.0 U H	64.0 UJ		ug/l	H2

Data Validation Report for 6802243481

Qualified Results associated with the Prep Hold Time for E625

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL LEACHATE-FAL22 680-224348-1	N	Benzidine	2000	2000 U H Q	2000 UJ		ug/l	H2/V2
DCL LEACHATE-FAL22 680-224348-1	N	Benzo(a)anthracene	80.0	64.0 U M H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Benzo(a)pyrene	80.0	64.0 U M H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Benzo(b)fluoranthene	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Benzo(g,h,i)perylene	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Benzo(k)fluoranthene	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Benzyl butyl phthalate	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Bis(2-chloroethoxy)methane	200	160 U H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Bis(2-chloroethyl) ether (2-Chloroethyl ether)	200	160 U H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Bis(2-ethylhexyl)phthalate	200	160 U M H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Chrysene	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Dibenz(a,h)anthracene	200	160 U H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Diethyl phthalate	80.0	20.0 U H	20.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Dimethyl phthalate	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	di-n-Butyl phthalate	80.0	64.0 U M H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	di-n-Octyl phthalate	200	160 U M H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Fluoranthene	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Fluorene	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Hexachlorobenzene	200	160 U H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Hexachlorobutadiene	200	160 U H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Hexachlorocyclopentadiene	1000	600 U H Q	600 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Hexachloroethane	200	160 U H	160 UJ		ug/l	C/H2
DCL LEACHATE-FAL22 680-224348-1	N	Indeno(1,2,3-c,d)pyrene	200	160 U H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Isophorone	200	160 U M H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Naphthalene	80.0	40.0 U H	40.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Nitrobenzene	200	160 U M H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	N-Nitrosodi-n-propylamine	200	160 U H	160 UJ		ug/l	H2

Data Validation Report for 6802243481

Qualified Results associated with the Prep Hold Time for E625

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL LEACHATE-FAL22 680-224348-1	N	N-Nitrosodiphenylamine	200	160 U H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Pentachlorophenol	1000	800 U H	800 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	Phenanthrene	80.0	64.0 U M H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Phenol	200	160 U H	160 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	Pyrene	200	160 U M H	160 UJ		ug/l	H2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802243481

Quality Control Outliers for test method E625, Surrogate

Method performance for individual samples is demonstrated through spiking activities. All samples are spiked with surrogate compounds prior to sample preparation. The sample itself may produce effects due to such factors as interferences and high concentrations of analytes. Summary forms were evaluated and compared to electronic data deliverables. Surrogate results that were outside of the acceptance criteria are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
DCL LEACHATE-FAL22 (N)	Phenol-d5	8.00	27 - 119	27 - 119	percent	J/X	I	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Surrogate for E625

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL LEACHATE-FAL22 680-224348-1	N	2,4,6-Trichlorophenol	200	160 U H	160 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	2,4-Dichlorophenol	200	160 U H	160 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	2,4-Dimethylphenol	200	160 U H	160 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	2-Chlorophenol	200	160 U H	160 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	2-Nitrophenol	200	160 U H	160 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	4,6-Dinitro-2-methylphenol	1000	600 U H	600 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	4-Chloro-3-methylphenol	200	160 U H	160 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	4-Nitrophenol	200	180 U M H	180 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	Pentachlorophenol	1000	800 U H	800 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	Phenol	200	160 U H	160 R		ug/l	H2/I

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802243481

Quality Control Outliers for test method M8015D, LCS Recovery

The laboratory control sample/laboratory control sample duplicate (LCS/LCSD) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LCS6807487542A (BS)	C10-C28 Petroleum Hydrocarbons	72.0	78 - 122	78 - 113	percent	J/R	C	
LCSD6807487543A (BD)	C10-C28 Petroleum Hydrocarbons	70.0	78 - 122	78 - 113	percent	J/R	C	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the LCS Recovery for M8015D

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL LEACHATE-FAL22 680-224348-1	N	C10-C28 Petroleum Hydrocarbons	0.300	0.150 U	0.150 UJ		mg/l	C

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802243481

Quality Control Outliers for test method SW6010C, Total, Calibration Blank

The purpose of calibration blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in calibration blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCB680748799106 (CB)	Cadmium	2.94	< 1	< 5	ug/l	U/None*	B2	
CCB680748799106 (CB)	Chromium	3.53	< 1.6	< 10	ug/l	U/None*	B2	
CCB680748799106 (CB)	Copper	3.95	< 1.8	< 20	ug/l	U/None*	B2	
CCB680748799106 (CB)	Nickel	3.94	< 2.1	< 40	ug/l	U/None*	B2	
CCB680748799106 (CB)	Silver	2.37	< 0.6	< 10	ug/l	U/None*	B2	
CCB68074879982 (CB)	Cadmium	2.82	< 1	< 5	ug/l	U/None*	B2	
CCB68074879982 (CB)	Chromium	3.39	< 1.6	< 10	ug/l	U/None*	B2	
CCB68074879982 (CB)	Copper	3.17	< 1.8	< 20	ug/l	U/None*	B2	
CCB68074879982 (CB)	Nickel	2.82	< 2.1	< 40	ug/l	U/None*	B2	
CCB68074879982 (CB)	Silver	1.95	< 0.6	< 10	ug/l	U/None*	B2	
CCB68074879994 (CB)	Cadmium	3.61	< 1	< 5	ug/l	U/None*	B2	
CCB68074879994 (CB)	Chromium	4.19	< 1.6	< 10	ug/l	U/None*	B2	
CCB68074879994 (CB)	Copper	4.17	< 1.8	< 20	ug/l	U/None*	B2	
CCB68074879994 (CB)	Nickel	3.29	< 2.1	< 40	ug/l	U/None*	B2	
CCB68074879994 (CB)	Silver	2.81	< 0.6	< 10	ug/l	U/None*	B2	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

*Blank flags displayed in the above table identify qualification of the sample result when it is less than or equal to the LOQ/RL. Sample results above the LOD or LOQ will be qualified based on the validation guidance assigned in the project setup.

No results associated with this QC element required qualification.

Data Validation Report for 6802243481

Quality Control Outliers for test method SW8081B, Continuing Calibration Verification

Compliance requirements for satisfactory continuing calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data. Continuing calibration is performed to verify and evaluate instrument performance during sample analysis. Summary forms were evaluated against project acceptance criteria, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCV68074907534 (CV)	Heptachlor	79.0	80 - 120	80 - 120	percent	J/UJ	V2	
CCVIS6807490753 (CV)	Endrin	123	80 - 120	80 - 120	percent	J/None	V2	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Continuing Calibration Verification for SW8081B

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL LEACHATE-FAL22 680-224348-1	N	Heptachlor	0.0460	0.00370 U Q	0.00370 UJ		ug/l	V2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802243481

Quality Control Outliers for test method SW9065, LCS Recovery

The laboratory control sample/laboratory control sample duplicate (LCS/LCSD) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LCS6807487012A (BS)	Phenolics, Total Recoverable	99.0	90 - 90	10 - 130	percent	J/None	C	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Data Validation Report for 6802243481

Table of All Qualified Results

Test Method: E625		Extraction Method: METHOD						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL LEACHATE-FAL22 680-224348-1	N	1,2,4-Trichlorobenzene	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	1,2-Dichlorobenzene	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	1,3-Dichlorobenzene	200	160 U H	160 UJ		ug/l	C/H2
DCL LEACHATE-FAL22 680-224348-1	N	1,4-Dichlorobenzene	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	2,2'-Oxybis(1- chloropropane)	200	160 U H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	2,4,6-Trichlorophenol	200	160 U H	160 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	2,4-Dichlorophenol	200	160 U H	160 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	2,4-Dimethylphenol	200	160 U H	160 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	2-Chloronaphthalene	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	2-Chlorophenol	200	160 U H	160 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	2-Nitrophenol	200	160 U H	160 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	3,3'-Dichlorobenzidine	1000	600 U H Q	600 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	4,6-Dinitro-2-methylphenol	1000	600 U H	600 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	4-Bromophenyl phenyl ether	200	160 U H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	4-Chloro-3-methylphenol	200	160 U H	160 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	4-Chlorophenyl phenyl ether	200	160 U H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	4-Nitrophenol	200	180 U M H	180 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	Acenaphthene	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Acenaphthylene	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Anthracene	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Benzidine	2000	2000 U H Q	2000 UJ		ug/l	H2/V2
DCL LEACHATE-FAL22 680-224348-1	N	Benzo(a)anthracene	80.0	64.0 U M H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Benzo(a)pyrene	80.0	64.0 U M H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Benzo(b)fluoranthene	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Benzo(g,h,i)perylene	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Benzo(k)fluoranthene	80.0	64.0 U H	64.0 UJ		ug/l	H2

Data Validation Report for 6802243481

Table of All Qualified Results

Test Method: E625		Extraction Method: METHOD						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
DCL LEACHATE-FAL22 680-224348-1	N	Benzyl butyl phthalate	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Bis(2-chloroethoxy)methane	200	160 U H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Bis(2-chloroethyl) ether (2-Chloroethyl ether)	200	160 U H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Bis(2-ethylhexyl)phthalate	200	160 U M H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Chrysene	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Dibenz(a,h)anthracene	200	160 U H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Diethyl phthalate	80.0	20.0 U H	20.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Dimethyl phthalate	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	di-n-Butyl phthalate	80.0	64.0 U M H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	di-n-Octyl phthalate	200	160 U M H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Fluoranthene	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Fluorene	80.0	64.0 U H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Hexachlorobenzene	200	160 U H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Hexachlorobutadiene	200	160 U H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Hexachlorocyclopentadiene	1000	600 U H Q	600 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Hexachloroethane	200	160 U H	160 UJ		ug/l	C/H2
DCL LEACHATE-FAL22 680-224348-1	N	Indeno(1,2,3-c,d)pyrene	200	160 U H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Isophorone	200	160 U M H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Naphthalene	80.0	40.0 U H	40.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Nitrobenzene	200	160 U M H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	N-Nitrosodi-n-propylamine	200	160 U H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	N-Nitrosodiphenylamine	200	160 U H	160 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Pentachlorophenol	1000	800 U H	800 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	Phenanthrene	80.0	64.0 U M H	64.0 UJ		ug/l	H2
DCL LEACHATE-FAL22 680-224348-1	N	Phenol	200	160 U H	160 R		ug/l	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	Pyrene	200	160 U M H	160 UJ		ug/l	H2

Data Validation Report for 6802243481

Table of All Qualified Results

Test Method: M8015D		Extraction Method: SW3510C							
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason	
DCL LEACHATE-FAL22 680-224348-1	N	C10-C28 Petroleum Hydrocarbons	0.300	0.150 U	0.150 UJ		mg/l	C	
Test Method: SW8081B		Extraction Method: SW3510C							
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason	
DCL LEACHATE-FAL22 680-224348-1	N	Heptachlor	0.0460	0.00370 U Q	0.00370 UJ		ug/l	V2	
Test Method: SW9040C		Extraction Method: NONE							
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason	
DCL LEACHATE-FAL22 680-224348-1	N	pH	2.00	6.40 HF	6.40 J		ph units	H1	

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ. Trace values are not included in the qualified results table unless additional reason codes are associated.

Data Validation Report for 6802243481

Table of Results with Modified Qualifiers

Modified Qualifiers for test method E625

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
DCL LEACHATE-FAL22 680-224348-1	N	1,2,4-Trichlorobenzene	80.0	64.0 U H	64.0 X	64.0 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	1,2-Dichlorobenzene	80.0	64.0 U H	64.0 X	64.0 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	1,3-Dichlorobenzene	200	160 U H	160 X	160 UJ	C/H2
DCL LEACHATE-FAL22 680-224348-1	N	1,4-Dichlorobenzene	80.0	64.0 U H	64.0 X	64.0 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	2,2'-Oxybis(1-chloropropane)	200	160 U H	160 X	160 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	2,4,6-Trichlorophenol	200	160 U H	160 X	160 R	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	2,4-Dichlorophenol	200	160 U H	160 X	160 R	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	2,4-Dimethylphenol	200	160 U H	160 X	160 R	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	2-Chloronaphthalene	80.0	64.0 U H	64.0 X	64.0 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	2-Chlorophenol	200	160 U H	160 X	160 R	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	2-Nitrophenol	200	160 U H	160 X	160 R	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	3,3'-Dichlorobenzidine	1000	600 U H Q	600 X	600 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	4,6-Dinitro-2-methylphenol	1000	600 U H	600 X	600 R	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	4-Bromophenyl phenyl ether	200	160 U H	160 X	160 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	4-Chloro-3-methylphenol	200	160 U H	160 X	160 R	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	4-Chlorophenyl phenyl ether	200	160 U H	160 X	160 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	4-Nitrophenol	200	180 U M H	180 X	180 R	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	Acenaphthene	80.0	64.0 U H	64.0 X	64.0 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Acenaphthylene	80.0	64.0 U H	64.0 X	64.0 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Anthracene	80.0	64.0 U H	64.0 X	64.0 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Benzidine	2000	2000 U H Q	2000 X	2000 UJ	H2/V2
DCL LEACHATE-FAL22 680-224348-1	N	Benzo(a)anthracene	80.0	64.0 U M H	64.0 X	64.0 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Benzo(a)pyrene	80.0	64.0 U M H	64.0 X	64.0 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Benzo(b)fluoranthene	80.0	64.0 U H	64.0 X	64.0 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Benzo(g,h,i)perylene	80.0	64.0 U H	64.0 X	64.0 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Benzo(k)fluoranthene	80.0	64.0 U H	64.0 X	64.0 UJ	H2

Data Validation Report for 6802243481

Table of Results with Modified Qualifiers

Modified Qualifiers for test method E625

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
DCL LEACHATE-FAL22 680-224348-1	N	Benzyl butyl phthalate	80.0	64.0 U H	64.0 X	64.0 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Bis(2-chloroethoxy)methane	200	160 U H	160 X	160 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Bis(2-chloroethyl) ether (2-Chloroethyl ether)	200	160 U H	160 X	160 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Bis(2-ethylhexyl)phthalate	200	160 U M H	160 X	160 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Chrysene	80.0	64.0 U H	64.0 X	64.0 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Dibenz(a,h)anthracene	200	160 U H	160 X	160 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Diethyl phthalate	80.0	20.0 U H	20.0 X	20.0 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Dimethyl phthalate	80.0	64.0 U H	64.0 X	64.0 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	di-n-Butyl phthalate	80.0	64.0 U M H	64.0 X	64.0 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	di-n-Octyl phthalate	200	160 U M H	160 X	160 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Fluoranthene	80.0	64.0 U H	64.0 X	64.0 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Fluorene	80.0	64.0 U H	64.0 X	64.0 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Hexachlorobenzene	200	160 U H	160 X	160 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Hexachlorobutadiene	200	160 U H	160 X	160 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Hexachlorocyclopentadiene	1000	600 U H Q	600 X	600 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Hexachloroethane	200	160 U H	160 X	160 UJ	C/H2
DCL LEACHATE-FAL22 680-224348-1	N	Indeno(1,2,3-c,d)pyrene	200	160 U H	160 X	160 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Isophorone	200	160 U M H	160 X	160 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Naphthalene	80.0	40.0 U H	40.0 X	40.0 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Nitrobenzene	200	160 U M H	160 X	160 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	N-Nitrosodi-n-propylamine	200	160 U H	160 X	160 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	N-Nitrosodiphenylamine	200	160 U H	160 X	160 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Pentachlorophenol	1000	800 U H	800 X	800 R	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	Phenanthrene	80.0	64.0 U M H	64.0 X	64.0 UJ	H2
DCL LEACHATE-FAL22 680-224348-1	N	Phenol	200	160 U H	160 X	160 R	H2/I
DCL LEACHATE-FAL22 680-224348-1	N	Pyrene	200	160 U M H	160 X	160 UJ	H2

Data Validation Report for 6802243481

Table of Results with Modified Qualifiers

Modified Qualifiers for test method M8015D

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
DCL LEACHATE-FAL22 680-224348-1	N	C10-C28 Petroleum Hydrocarbons	0.300	0.150 U	0.150 R	0.150 UJ	C

Modified Qualifiers for test method SW9040C

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
DCL LEACHATE-FAL22 680-224348-1	N	pH	2.00	6.40 HF	6.40	6.40 J	H1

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ. Trace values are not included in the qualified results table unless additional reason codes are associated.

Reason Code Definitions

Code	Definition
B2	CCB
C	LCS Recovery
H1	Test Hold Time
H2	Prep Hold Time
I	Surrogate recovery outside project limits.
L	Lab Blank
TR	Trace Level Detect
V2	CCV

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Data Validation Report for 6802243481

Review Questions

Method: A2540D (Total Suspended Solids Dried at 103-105 C)

Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?			•	Not applicable to this method.
Were all reported analytes for the ICV within the required criteria?			•	Not applicable to this method.
Were ICB/CCBs run at the required frequency?			•	Not applicable to this method.
Were target analytes in the ICBs/CCBs non-detect?			•	Not applicable to this method.
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Data Validation Report for 6802243481

Review Questions

Method: E624 (Volatile Organics GC/MS)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?		•		ICV %D greater than %D limits but no results were qualified.
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?		•		Analyte detected in the method blank but no results were qualified.
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?		•		Data acceptable as reported and qualified.
Were any data recommended for rejection (exclusion) in the data validation process?				

Data Validation Report for 6802243481

Review Questions

Method: E625 (Extractable Priority Pollutants (Base/Neutral and Acid))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?		•		Several results qualified UJ due to being prepared and analyzed outside of holding time.
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?		•		One result qualified UJ due to CCV%D being greater than %D limits.
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?		•		Several results qualified X due to surrogate %R being lower than %R limits.
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?		•		Two results qualified UJ due to LCS/LCSD %R being lower than %R limits.
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?	•			Several results recommended for exclusion due to surrogate %R being out of %R limits.

Data Validation Report for 6802243481

Review Questions

Method: M8015D (Modified SW8015 for the Determination of Diesel Range Organics in Soil and Water, GC/FID)

Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Data Validation Report for 6802243481

Review Questions

Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Data Validation Report for 6802243481

Review Questions

Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?		•		Several analytes detected in the CCB but no results were qualified.
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Data Validation Report for 6802243481

Review Questions

Method: SW7470A (Mercury in Water (Manual Cold-Vapor Technique))

Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?				
Were samples preserved properly and received in good condition?				
Were holding times met?				
Were all requested target analytes reported?				
Was the Calibration within acceptance criteria?				
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?				
Were all reported analytes for the ICV within the required criteria?				
Were ICB/CCBs run at the required frequency?				
Were target analytes in the ICBs/CCBs non-detect?				
Was a method blank prepared and analyzed with each batch?				
Were target analytes in the method blank less than MDL?				
Were field blanks (EBs or FBs) submitted with these samples?				
Were target analytes reported in the field blank(s) less than MDL?				
Was an LCS/LCSD pair prepared and analyzed with each batch?				
Were LCS/LCSD recoveries within project acceptance limits?				
Was the LCS/LCSD RPD within project acceptance limits?				
Was a MS/MSD pair prepared with each batch?				
Were MS/MSD recoveries within project acceptance limits?				
Was the MS/MSD RPD within project acceptance limits?				
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?				
Were QAPP specified laboratory LOQs/RLs achieved?				
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?				
Were any data recommended for rejection (exclusion) in the data validation process?				

Data Validation Report for 6802243481

Review Questions

Method: SW8081B (Organochlorine Pesticides by Capillary GC)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?		•		One result qualified UJ due to CCV %D being greater than %D limits.
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Data Validation Report for 6802243481

Review Questions

Method: SW9012B (Total and Amenable Cyanide (Automated Colorimetric, with Off-Line Distillation))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Data Validation Report for 6802243481

Review Questions

Method: SW9040C (pH Electrometric Measurement)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?		•		One result qualified J due to being analyzed outside of holding time.
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?			•	Not applicable to this method.
Were all reported analytes for the ICV within the required criteria?			•	Not applicable to this method.
Were ICB/CCBs run at the required frequency?			•	Not applicable to this method.
Were target analytes in the ICBs/CCBs non-detect?			•	Not applicable to this method.
Was a method blank prepared and analyzed with each batch?			•	Not applicable to this method.
Were target analytes in the method blank less than MDL?			•	Not applicable to this method.
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Data Validation Report for 6802243481

Review Questions

Method: SW9065 (Phenolics (Spectrophotometric, Manual 4-AAP with Distillation))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Data Validation Report for 680-224348-2

Facility: Former Fort Devens, Long Term Monitoring
Event: Seres-Arcadis JV, Long Term Monitoring, DCL Leach, Fall 2022
SDG: 680-224348-2
Guidance Document: Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
Prime Contractor: Seres-Arcadis JV
Project Manager: Jennifer Singer
Contract Laboratory(ies): Eurofins Environment Testing TestAmerica, Savannah, GA
Data Review Contractor: Laboratory Data Consultants, Inc.
Data Review Level: 2B
Primary Data Reviewer: Long Ngo, Environmental Scientist
Second Reviewer: Pei Geng, Senior Scientist
Date Submitted: February 08, 2023

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	SW8082A
DCL LEACHATE-FAL22	680-224348-1	Liquid	Field Sample/N	X

Data Validation Report for 680-224348-2

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Eurofins Environment Testing TestAmerica, Savannah, GA and were reported under sample delivery group (SDG) 680-224348-2. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Continuing Calibration Verification
- Lab Blank
- LCS Recovery
- LCS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 0 results (0.00%) out of the 7 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Data Validation Report for 680-224348-2

Narrative Comments

Analytical Method	Data Reviewer Comment
SW8082A	No additional comments; see Checklist for detail.



February 08, 2023

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.



March 01, 2023

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Data Validation Report for 680-224348-2

Quality Control Outliers for test method SW8082A, Continuing Calibration Verification

Compliance requirements for satisfactory continuing calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data. Continuing calibration is performed to verify and evaluate instrument performance during sample analysis. Summary forms were evaluated against project acceptance criteria, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
CCV68074907235 (CV)	PCB-1260 (Aroclor 1260)	142	80 - 120	80 - 120	percent	J/None	V2	
CCV6807490725 (CV)	PCB-1260 (Aroclor 1260)	130	80 - 120	80 - 120	percent	J/None	V2	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Data Validation Report for 680-224348-2

Qualified Results

No results associated with this sample delivery group required qualification.

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

Reason Code Definitions

Code	Definition
V2	CCV

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Data Validation Report for 680-224348-2

Review Questions

Method: SW8082A (Polychlorinated Biphenyls (PCB))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?		•		CCV %D was greater than %D limits for two analytes but no results were qualified due to being non-detects.
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.



LABORATORY DATA CONSULTANTS, INC.

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

February 13, 2023

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on January 18, 2023. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #55942 D:

SDG #

680-224679-1

Fraction

Alkalinity, Volatile Petroleum Hydrocarbons, Metals

The data validation was performed under Stage 2B guidelines. The analysis was validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng

pgeng@lab-data.com

Project Manager/Senior Chemist

Stage 2B EQUIS EDD

LDC# 55942 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	VOA (8260D)		Pest. (8081B)		Metals (6010C/20A /7470A)		Fe,Mn (6010C)		Mn (6010C)		Diss. Mn (6010C)		3 D.Met. (6010C /6020A)		VPH (MADEP -VPH)		EPH (MADEP -EPH)		Alk (2320B)		COD (410.4)		CN- (9012B)		Cl (9056A)		DOC (9060A)		NO ₃ /NO ₂ -N (353.2)		SO ₄ (9056A)		TDS (2540C)					
				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S		
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-224346-1	01/18/23	02/01/23	-	-	4	0	4	0	-	-	-	-	-	-	-	-	4	0	4	0	4	0	4	0	4	0	4	0	-	-	4	0	4	0	4	0	4	0	4	0
B	680-224347-1	01/18/23	02/01/23	5	0	5	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	0	5	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	680-224673-1	01/18/23	02/01/23	-	-	-	-	-	-	-	-	-	-	1	0	9	0	-	-	8	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D	680-224679-1	01/18/23	02/01/23	-	-	-	-	-	-	5	0	1	0	-	-	-	-	5	0	-	-	5	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E	680-224679-2	01/18/23	02/01/23	-	-	-	-	-	-	-	-	-	-	-	-	1	0	-	-	-	-	1	0	-	-	-	-	1	0	1	0	-	-	4	0	-	-	-	-	-	-
F	680-224848-1	01/18/23	02/01/23	-	-	-	-	-	-	-	-	-	-	-	-	1	0	-	-	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
G	680-224848-2	01/18/23	02/01/23	-	-	-	-	-	-	-	-	-	-	-	-	8	0	-	-	-	-	8	0	-	-	-	-	8	0	8	0	-	-	8	0	-	-	-	-	-	-
Total	TR/PG			5	0	9	0	4	0	5	0	1	0	1	0	19	0	9	0	13	0	18	0	9	0	9	0	13	0	9	0	4	0	16	0	4	0	4	0	148	

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

Data Validation Report for 6802246791

Facility: Former Fort Devens, Long Term Monitoring
 Event: Seres-Arcadis JV, Long Term Monitoring, AOC 43G, Fall 2022
 SDG: 6802246791
 Guidance Document: Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
 Prime Contractor: Seres-Arcadis JV
 Project Manager: Jennifer Singer
 Contract Laboratory(ies): Eurofins Environment Testing TestAmerica, Savannah, GA | Eurofins Spectrum Analytical, Inc., North Kingston, RI
 Data Review Contractor: Laboratory Data Consultants, Inc.
 Data Review Level: 2B
 Primary Data Reviewer: Long Ngo, Environmental Scientist
 Second Reviewer: Pei Geng, Senior Scientist
 Date Submitted: February 13, 2023

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	A2320B	MADEPVP	SW6010C
AAFES-2-FAL22	680-224679-1	Water	Field Sample/N	X	X	X
AAFES-7-FAL22	680-224679-2	Water	Field Sample/N			X
AOC43G-DUP01-FAL22	680-224679-3	Water	Field Duplicate/FD	X	X	X
XGM-93-02X-FAL22	680-224679-4	Water	Field Sample/N	X	X	X
XGM-94-04X-FAL22	680-224679-5	Water	Field Sample/N	X	X	X
XGM-97-12X-FAL22	680-224679-6	Water	Field Sample/N	X	X	X

Data Validation Report for 6802246791

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Eurofins Environment Testing TestAmerica, Savannah, GA | Eurofins Spectrum Analytical, Inc., North Kingston, RI and were reported under sample delivery group (SDG) 6802246791. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Field Duplicate RPD
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 12 results (18.18%) out of the 66 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Data Validation Report for 6802246791

Narrative Comments

Analytical Method	Data Reviewer Comment
A2320B	No additional comments; see Checklist for detail.
MADEPVP	No additional comments; see Checklist for detail.
SW6010C	No additional comments; see Checklist for detail.



February 13, 2023

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.



February 13, 2023

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Data Validation Report for 6802246791

Quality Control Outliers for test method A2320B, Test Hold Time

Hold times are ascertained based on project requirements. Holding times were determined by comparing the chain of custody records with the dates of analysis found in the electronic data deliverable and laboratory summary forms. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
AAFES-2-FAL22 (N)		14.5	< 14	< 28	days	J/UJ	H1	Test Exceeds UWL
AOC43G-DUP01-FAL22 (FD)		14.6	< 14	< 28	days	J/UJ	H1	Test Exceeds UWL
XGM-93-02X-FAL22 (N)		14.5	< 14	< 28	days	J/UJ	H1	Test Exceeds UWL
XGM-94-04X-FAL22 (N)		14.6	< 14	< 28	days	J/UJ	H1	Test Exceeds UWL
XGM-97-12X-FAL22 (N)		14.6	< 14	< 28	days	J/UJ	H1	Test Exceeds UWL

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Test Hold Time for A2320B

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
AAFES-2-FAL22 680-224679-1	N	Alkalinity, Total (as CaCO ₃)	5.00	140 H	140 J	-	mg/l	H1
AOC43G-DUP01-FAL22 680-224679-3	FD	Alkalinity, Total (as CaCO ₃)	5.00	180 H	180 J	-	mg/l	H1
XGM-93-02X-FAL22 680-224679-4	N	Alkalinity, Total (as CaCO ₃)	5.00	180 H	180 J	-	mg/l	H1
XGM-94-04X-FAL22 680-224679-5	N	Alkalinity, Total (as CaCO ₃)	5.00	170 H	170 J	-	mg/l	H1
XGM-97-12X-FAL22 680-224679-6	N	Alkalinity, Total (as CaCO ₃)	5.00	180 H	180 J	-	mg/l	H1

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802246791

Quality Control Outliers for test method MADEPVP, Lab Blank

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
MB620172326 (LB)	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	9.12	< 0.55	< 100	ug/l	U/None*	L	
MB620172326 (LB)	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	10.8	< 0.85	< 100	ug/l	U/None*	L	
MB620172326 (LB)	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	2.72	< 1.9	< 100	ug/l	U/None*	L	
MB620172916 (LB)	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	8.68	< 0.55	< 100	ug/l	U/None*	L	
MB620172916 (LB)	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	10.3	< 0.85	< 100	ug/l	U/None*	L	
MB620172916 (LB)	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	3.37	< 1.9	< 100	ug/l	U/None*	L	
MB620173386 (LB)	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	9.21	< 0.55	< 100	ug/l	U/None*	L	
MB620173386 (LB)	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	11.9	< 0.85	< 100	ug/l	U/None*	L	

Data Validation Report for 6802246791

Quality Control Outliers for test method MADEPVP, Lab Blank

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
MB620173386 (LB)	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	2.89	< 1.9	< 100	ug/l	U/None*	L	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

*Blank flags displayed in the above table identify qualification of the sample result when it is less than or equal to the LOQ/RL. Sample results above the LOQ will be qualified based on the validation type such as J+ at the sample result.

Qualified Results associated with the Lab Blank for MADEPVP

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
AOC43G-DUP01-FAL22 680-224679-3	FD	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	500	350 J D	500 U		ug/l	L
XGM-93-02X-FAL22 680-224679-4	N	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	100	50.0 J	100 U		ug/l	L
XGM-93-02X-FAL22 680-224679-4	N	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	89.0 J	100 U		ug/l	L
XGM-97-12X-FAL22 680-224679-6	N	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	500	330 J D	500 U		ug/l	L

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802246791

Quality Control Outliers for test method MADEPVP, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
XGM-94-04X-FAL22 (MS)	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	460	70 - 130	10 - 130	percent	J/None	M	Spike amount Insignificant
XGM-94-04X-FAL22 (SD)	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	790	70 - 130	10 - 130	percent	J/None	M	Spike amount Insignificant

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Data Validation Report for 6802246791

Quality Control Outliers for test method MADEPVP, Surrogate

Method performance for individual samples is demonstrated through spiking activities. All samples are spiked with surrogate compounds prior to sample preparation. The sample itself may produce effects due to such factors as interferences and high concentrations of analytes. Summary forms were evaluated and compared to electronic data deliverables. Surrogate results that were outside of the acceptance criteria are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
AOC43G-DUP01-FAL22 (FD)	2,5-Dibromotoluene	138	70 - 130	10 - 130	percent	J/None	I	
XGM-97-12X-FAL22 (N)	2,5-Dibromotoluene	134	70 - 130	10 - 130	percent	J/None	I	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Surrogate for MADEPVP

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
AOC43G-DUP01-FAL22 680-224679-3	FD	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	190	190 J	+	ug/l	I
XGM-97-12X-FAL22 680-224679-6	N	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	190	190 J	+	ug/l	I

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802246791

Quality Control Outliers for test method SW6010C, Total, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
XGM-94-04X-FAL22 (SD)	Iron	84.0	87 - 115	10 - 125	percent	J/UJ	M	
XGM-94-04X-FAL22 (MS)	Manganese	13.0	90 - 114	10 - 125	percent	J/UJ	M	Spike amount Insignificant
XGM-94-04X-FAL22 (SD)	Manganese	-140	90 - 114	10 - 125	percent	J/X	M	Spike amount Insignificant

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the MS Recovery for SW6010C, Total

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
XGM-94-04X-FAL22 680-224679-5	N	Iron	100	4800 J1	4800 J	-	ug/l	M

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802246791

Table of All Qualified Results

Test Method: A2320B		Extraction Method: NONE						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
AAFES-2-FAL22 680-224679-1	N	Alkalinity, Total (as CaCO3)	5.00	140 H	140 J	-	mg/l	H1
AOC43G-DUP01-FAL22 680-224679-3	FD	Alkalinity, Total (as CaCO3)	5.00	180 H	180 J	-	mg/l	H1
XGM-93-02X-FAL22 680-224679-4	N	Alkalinity, Total (as CaCO3)	5.00	180 H	180 J	-	mg/l	H1
XGM-94-04X-FAL22 680-224679-5	N	Alkalinity, Total (as CaCO3)	5.00	170 H	170 J	-	mg/l	H1
XGM-97-12X-FAL22 680-224679-6	N	Alkalinity, Total (as CaCO3)	5.00	180 H	180 J	-	mg/l	H1
Test Method: MADEPVP		Extraction Method: SW5030C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
AOC43G-DUP01-FAL22 680-224679-3	FD	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	190	190 J	+	ug/l	I
AOC43G-DUP01-FAL22 680-224679-3	FD	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	500	350 J D	500 U		ug/l	L
XGM-93-02X-FAL22 680-224679-4	N	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	100	50.0 J	100 U		ug/l	L
XGM-93-02X-FAL22 680-224679-4	N	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	89.0 J	100 U		ug/l	L
XGM-97-12X-FAL22 680-224679-6	N	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	100	190	190 J	+	ug/l	I
XGM-97-12X-FAL22 680-224679-6	N	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	500	330 J D	500 U		ug/l	L
Test Method: SW6010C		Extraction Method: TOTAL						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
XGM-94-04X-FAL22 680-224679-5	N	Iron	100	4800 J1	4800 J	-	ug/l	M

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ. Trace values are not included in the qualified results table unless additional reason codes are associated.

Data Validation Report for 6802246791

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

Reason Code Definitions

Code	Definition
H1	Test Hold Time
I	Surrogate recovery outside project limits.
L	Lab Blank
M	MS Recovery
TR	Trace Level Detect

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Data Validation Report for 6802246791

Review Questions

Method: A2320B (Alkalinity by Titrimetric Method)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?		•		Several results qualified J- due to alkalinity being analyzed outside the 14 day holding time.
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?			•	Not applicable to this method.
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?			•	Not applicable to this method.
Were all reported analytes for the ICV within the required criteria?			•	Not applicable to this method.
Were ICB/CCBs run at the required frequency?			•	Not applicable to this method.
Were target analytes in the ICBs/CCBs non-detect?			•	Not applicable to this method.
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Data Validation Report for 6802246791

Review Questions

Method: MADEPVP (Method for the Determination of Volatile Petroleum Hydrocarbons (VPH))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?		•		Several results qualified J+ due to surrogate %R being greater than %R limits.
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?		•		Several results qualified U at the LOQ due to method blank contamination.
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?		•		MS/MSD %R greater than %R limits but no results were qualified due to sample amount being 4x greater than spike amount.
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Data Validation Report for 6802246791

Review Questions

Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?		•		One result qualified J- due to MS/MSD %R being lower than %R limits. Manganese results not qualified due to sample amount being 4x greater than spike amount.
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring
 Seres-Arcadis JV, Long Term Monitoring, AOC 43G, Fall 2022
 Field Duplicates for SDG: 6802246791

Location	Analysis									
XGM-97-12X	A2320B									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
XGM-97-12X-FAL22 / AOC43G-DUP01-FAL22	680-224679-6 / 680-224679-3	Alkalinity, Total (as CaCO3)	180	180	5.00	0.00	30	OK	NA	

Location	Analysis									
XGM-97-12X	MADEPVP									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
XGM-97-12X-FAL22 / AOC43G-DUP01-FAL22	680-224679-6 / 680-224679-3	Benzene	ND	ND	5.00	NA	30	NA	OK	
XGM-97-12X-FAL22 / AOC43G-DUP01-FAL22	680-224679-6 / 680-224679-3	C5-C8 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	190	190	100	0.00	30	NA	OK	
XGM-97-12X-FAL22 / AOC43G-DUP01-FAL22	680-224679-6 / 680-224679-3	C9-C10 Volatile Petroleum Hydrocarbons, Aromatic	160	160	100	0.00	30	NA	OK	
XGM-97-12X-FAL22 / AOC43G-DUP01-FAL22	680-224679-6 / 680-224679-3	C9-C12 Volatile Petroleum Hydrocarbons Aliphatic, Adjusted for Target Analytes, Surrogates and Internal Standards	ND	ND	500	NA	30	NA	OK	
XGM-97-12X-FAL22 / AOC43G-DUP01-FAL22	680-224679-6 / 680-224679-3	Ethylbenzene	ND	ND	5.00	NA	30	NA	OK	
XGM-97-12X-FAL22 / AOC43G-DUP01-FAL22	680-224679-6 / 680-224679-3	m,p-Xylene	ND	ND	10.0	NA	30	NA	OK	
XGM-97-12X-FAL22 / AOC43G-DUP01-FAL22	680-224679-6 / 680-224679-3	Methyl tert-butyl ether (MTBE)	ND	ND	5.00	NA	30	NA	OK	
XGM-97-12X-FAL22 / AOC43G-DUP01-FAL22	680-224679-6 / 680-224679-3	Naphthalene	ND	ND	5.00	NA	30	NA	OK	
XGM-97-12X-FAL22 / AOC43G-DUP01-FAL22	680-224679-6 / 680-224679-3	o-Xylene	ND	ND	5.00	NA	30	NA	OK	
XGM-97-12X-FAL22 / AOC43G-DUP01-FAL22	680-224679-6 / 680-224679-3	Toluene	ND	ND	5.00	NA	30	NA	OK	

FD = Field Duplicate
 RL = Reporting Limit
 RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring

Seres-Arcadis JV, Long Term Monitoring, AOC 43G, Fall 2022

Field Duplicates for SDG: 6802246791

Location	Analysis									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
XGM-97-12X	SW6010C									
XGM-97-12X-FAL22 / AOC43G-DUP01-FAL22	680-224679-6 / 680-224679-3	Iron (TOTAL)	16000	16000	100	0.00	30	OK	NA	
XGM-97-12X-FAL22 / AOC43G-DUP01-FAL22	680-224679-6 / 680-224679-3	Manganese (TOTAL)	1100	1100	10.0	0.00	30	OK	NA	

FD = Field Duplicate

RL = Reporting Limit

RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"



LABORATORY DATA CONSULTANTS, INC.

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

February 13, 2023

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on January 18, 2023. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #55942_C:

SDG #

680-224673-1

Fraction

Extractable Petroleum Hydrocarbons, Dissolved Metals

The data validation was performed under Stage 2B guidelines. The analysis was validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng

pgeng@lab-data.com

Project Manager/Senior Chemist

Stage 2B EQUIS EDD

LDC# 55942 (Arcadis - Millersville, MD / Fort Devens)

LDC	SDG#	DATE REC'D	(2) DATE DUE	VOA (8260D)		Pest. (8081B)		Metals (6010C/20A /7470A)		Fe,Mn (6010C)		Mn (6010C)		Diss. Mn (6010C)		3 D.Met. (6010C /6020A)		VPH (MADEP -VPH)		EPH (MADEP -EPH)		Alk (2320B)		COD (410.4)		CN- (9012B)		Cl (9056A)		DOC (9060A)		NO ₃ /NO ₂ -N (353.2)		SO ₄ (9056A)		TDS (2540C)					
				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S		
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	680-224346-1	01/18/23	02/01/23	-	-	4	0	4	0	-	-	-	-	-	-	-	-	4	0	4	0	4	0	4	0	4	0	4	0	-	-	4	0	4	0	4	0	4	0	4	0
B	680-224347-1	01/18/23	02/01/23	5	0	5	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	0	5	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	680-224673-1	01/18/23	02/01/23	-	-	-	-	-	-	-	-	-	-	1	0	9	0	-	-	8	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D	680-224679-1	01/18/23	02/01/23	-	-	-	-	-	-	5	0	1	0	-	-	-	-	5	0	-	-	5	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E	680-224679-2	01/18/23	02/01/23	-	-	-	-	-	-	-	-	-	-	-	-	1	0	-	-	-	-	1	0	-	-	-	-	1	0	1	0	-	-	4	0	-	-	-	-	-	-
F	680-224848-1	01/18/23	02/01/23	-	-	-	-	-	-	-	-	-	-	-	-	1	0	-	-	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
G	680-224848-2	01/18/23	02/01/23	-	-	-	-	-	-	-	-	-	-	-	-	8	0	-	-	-	-	8	0	-	-	-	-	8	0	8	0	-	-	8	0	-	-	-	-	-	-
Total	TR/PG			5	0	9	0	4	0	5	0	1	0	1	0	19	0	9	0	13	0	18	0	9	0	9	0	13	0	9	0	4	0	16	0	4	0	4	0	148	

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

Data Validation Report for 6802246731

Facility: Former Fort Devens, Long Term Monitoring
 Event: Seres-Arcadis JV, Long Term Monitoring, AOC 69W, Fall 2022
 SDG: 6802246731
 Guidance Document: Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
 Prime Contractor: Seres-Arcadis JV
 Project Manager: Jennifer Singer
 Contract Laboratory(ies): Eurofins Environment Testing TestAmerica, Savannah, GA | Eurofins Spectrum Analytical, Inc., North Kingston, RI
 Data Review Contractor: Laboratory Data Consultants, Inc.
 Data Review Level: 2B
 Primary Data Reviewer: Long Ngo, Environmental Scientist
 Second Reviewer: Pei Geng, Senior Scientist
 Date Submitted: February 13, 2023

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	MADEPEP	SW6010C - Dissolved	SW6020A - Dissolved
69W-94-13-FAL22	680-224673-1	Water	Field Sample/N	X	X	X
69W-94-14-FAL22	680-224673-2	Water	Field Sample/N	X	X	X
69WP-08-01-FAL22	680-224673-3	Water	Field Sample/N		X	X
69WP-13-01-FAL22	680-224673-4	Water	Field Sample/N		X	
AOC69W-DUP01-FAL22	680-224673-5	Water	Field Duplicate/FD	X	X	X
ZWM-01-25X-FAL22	680-224673-6	Water	Field Sample/N	X	X	X
ZWM-95-15X-FAL22	680-224673-7	Water	Field Sample/N	X	X	X
ZWM-99-22X-FAL22	680-224673-8	Water	Field Sample/N	X	X	X
ZWM-99-23X-FAL22	680-224673-9	Water	Field Sample/N	X	X	X
ZWM-99-24X-FAL22	680-224673-10	Water	Field Sample/N	X	X	X

Data Validation Report for 6802246731

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Eurofins Environment Testing TestAmerica, Savannah, GA | Eurofins Spectrum Analytical, Inc., North Kingston, RI and were reported under sample delivery group (SDG) 6802246731. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Field Duplicate RPD
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- LCS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 15 results (7.98%) out of the 188 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Data Validation Report for 6802246731

Narrative Comments

Analytical Method	Data Reviewer Comment
MADEPEP	No additional comments; see Checklist for detail.
SW6010C	No additional comments; see Checklist for detail.
SW6020A	No additional comments; see Checklist for detail.



February 13, 2023

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.



February 13, 2023

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Data Validation Report for 6802246731

Quality Control Outliers for test method MADEPEP, Lab Blank

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
MB620173051B (LB)	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	96.2	< 55	< 100	ug/l	U/None*	L	
MB620173051B (LB)	C19-C36 Petroleum Hydrocarbons, Aliphatic	66.9	< 14	< 100	ug/l	U/None*	L	
MB620173051B (LB)	C9-C18 Petroleum Hydrocarbons, Aliphatic	56.9	< 29	< 100	ug/l	U/None*	L	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

*Blank flags displayed in the above table identify qualification of the sample result when it is less than or equal to the LOQ/RL. Sample results above the LOQ will be qualified based on the validation type such as J+ at the sample result.

Qualified Results associated with the Lab Blank for MADEPEP

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
69W-94-13-FAL22 680-224673-1	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	95.0	61.0 J B	95.0 U		ug/l	L
69W-94-13-FAL22 680-224673-1	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	95.0	36.0 J M B	95.0 U		ug/l	L
69W-94-14-FAL22 680-224673-2	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	95.0	34.0 J M B	95.0 U		ug/l	L
AOC69W-DUP01-FAL22 680-224673-5	FD	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	170	170 B	170 U		ug/l	L
AOC69W-DUP01-FAL22 680-224673-5	FD	C19-C36 Petroleum Hydrocarbons, Aliphatic	100	29.0 J M B	100 U		ug/l	L
ZWM-01-25X-FAL22 680-224673-6	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	110	40.0 J M B	110 U		ug/l	L
ZWM-95-15X-FAL22 680-224673-7	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	95.0	38.0 J M B	95.0 U		ug/l	L
ZWM-99-22X-FAL22 680-224673-8	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	130	130 B	130 U		ug/l	L

Data Validation Report for 6802246731

Qualified Results associated with the Lab Blank for MADEPEP

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
ZWM-99-22X-FAL22 680-224673-8	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	95.0	54.0 J M B	95.0 U		ug/l	L
ZWM-99-22X-FAL22 680-224673-8	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	95.0	31.0 J B	95.0 U		ug/l	L
ZWM-99-23X-FAL22 680-224673-9	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	100	55.0 J B	100 U		ug/l	L
ZWM-99-23X-FAL22 680-224673-9	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	100	84.0 J M B	100 U		ug/l	L
ZWM-99-23X-FAL22 680-224673-9	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	100	32.0 J B	100 U		ug/l	L
ZWM-99-24X-FAL22 680-224673-10	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	95.0	44.0 J M B	95.0 U		ug/l	L
ZWM-99-24X-FAL22 680-224673-10	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	95.0	29.0 J B	95.0 U		ug/l	L

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802246731

Table of All Qualified Results

Test Method: MADEPEP		Extraction Method: SW3510C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
69W-94-13-FAL22 680-224673-1	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	95.0	61.0 J B	95.0 U		ug/l	L
69W-94-13-FAL22 680-224673-1	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	95.0	36.0 J M B	95.0 U		ug/l	L
69W-94-14-FAL22 680-224673-2	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	95.0	34.0 J M B	95.0 U		ug/l	L
AOC69W-DUP01-FAL22 680-224673-5	FD	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	170	170 B	170 U		ug/l	L
AOC69W-DUP01-FAL22 680-224673-5	FD	C19-C36 Petroleum Hydrocarbons, Aliphatic	100	29.0 J M B	100 U		ug/l	L
ZWM-01-25X-FAL22 680-224673-6	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	110	40.0 J M B	110 U		ug/l	L
ZWM-95-15X-FAL22 680-224673-7	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	95.0	38.0 J M B	95.0 U		ug/l	L
ZWM-99-22X-FAL22 680-224673-8	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	130	130 B	130 U		ug/l	L
ZWM-99-22X-FAL22 680-224673-8	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	95.0	54.0 J M B	95.0 U		ug/l	L
ZWM-99-22X-FAL22 680-224673-8	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	95.0	31.0 J B	95.0 U		ug/l	L
ZWM-99-23X-FAL22 680-224673-9	N	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	100	55.0 J B	100 U		ug/l	L
ZWM-99-23X-FAL22 680-224673-9	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	100	84.0 J M B	100 U		ug/l	L
ZWM-99-23X-FAL22 680-224673-9	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	100	32.0 J B	100 U		ug/l	L
ZWM-99-24X-FAL22 680-224673-10	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	95.0	44.0 J M B	95.0 U		ug/l	L
ZWM-99-24X-FAL22 680-224673-10	N	C9-C18 Petroleum Hydrocarbons, Aliphatic	95.0	29.0 J B	95.0 U		ug/l	L

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ. Trace values are not included in the qualified results table unless additional reason codes are associated.

Data Validation Report for 6802246731

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

Reason Code Definitions

Code	Definition
L	Lab Blank
TR	Trace Level Detect

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Data Validation Report for 6802246731

Review Questions

Method: MADEPEP (Method for the Determination of Extractable Petroleum Hydrocarbons (EPH))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?		•		Several results qualified U at the LOQ due to method blank contamination.
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Data Validation Report for 6802246731

Review Questions

Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	.			
Were samples preserved properly and received in good condition?	.			
Were holding times met?	.			
Were all requested target analytes reported?	.			
Was the Calibration within acceptance criteria?	.			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	.			
Were all reported analytes for the ICV within the required criteria?	.			
Were ICB/CCBs run at the required frequency?	.			
Were target analytes in the ICBs/CCBs non-detect?	.			
Was a method blank prepared and analyzed with each batch?	.			
Were target analytes in the method blank less than MDL?	.			
Were field blanks (EBs or FBs) submitted with these samples?			.	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			.	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	.			
Were LCS/LCSD recoveries within project acceptance limits?	.			
Was the LCS/LCSD RPD within project acceptance limits?	.			
Was a MS/MSD pair prepared with each batch?			.	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			.	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			.	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	.			
Were QAPP specified laboratory LOQs/RLs achieved?	.			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	.			
Were any data recommended for rejection (exclusion) in the data validation process?		.		Data acceptable as reported and qualified.

Data Validation Report for 6802246731

Review Questions

Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?	•			
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring
 Seres-Arcadis JV, Long Term Monitoring, AOC 69W, Fall 2022
 Field Duplicates for SDG: 6802246731

Location	Analysis									
ZWM-99-22X	MADEPEP									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
ZWM-99-22X-FAL22 / AOC69W-DUP01-FAL22	680-224673-8 / 680-224673-5	2-Methylnaphthalene	ND	ND	4.80	NA	30	NA	OK	
ZWM-99-22X-FAL22 / AOC69W-DUP01-FAL22	680-224673-8 / 680-224673-5	Acenaphthene	ND	ND	4.80	NA	30	NA	OK	
ZWM-99-22X-FAL22 / AOC69W-DUP01-FAL22	680-224673-8 / 680-224673-5	Acenaphthylene	ND	ND	4.80	NA	30	NA	OK	
ZWM-99-22X-FAL22 / AOC69W-DUP01-FAL22	680-224673-8 / 680-224673-5	Anthracene	ND	ND	4.80	NA	30	NA	OK	
ZWM-99-22X-FAL22 / AOC69W-DUP01-FAL22	680-224673-8 / 680-224673-5	Benzo(a)anthracene	ND	ND	4.80	NA	30	NA	OK	
ZWM-99-22X-FAL22 / AOC69W-DUP01-FAL22	680-224673-8 / 680-224673-5	Benzo(a)pyrene	ND	ND	4.80	NA	30	NA	OK	
ZWM-99-22X-FAL22 / AOC69W-DUP01-FAL22	680-224673-8 / 680-224673-5	Benzo(b)fluoranthene	ND	ND	4.80	NA	30	NA	OK	
ZWM-99-22X-FAL22 / AOC69W-DUP01-FAL22	680-224673-8 / 680-224673-5	Benzo(g,h,i)perylene	ND	ND	4.80	NA	30	NA	OK	
ZWM-99-22X-FAL22 / AOC69W-DUP01-FAL22	680-224673-8 / 680-224673-5	Benzo(k)fluoranthene	ND	ND	4.80	NA	30	NA	OK	
ZWM-99-22X-FAL22 / AOC69W-DUP01-FAL22	680-224673-8 / 680-224673-5	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	ND	ND	130	NA	30	NA	OK	
ZWM-99-22X-FAL22 / AOC69W-DUP01-FAL22	680-224673-8 / 680-224673-5	C19-C36 Petroleum Hydrocarbons, Aliphatic	ND	ND	95.0	NA	30	NA	OK	
ZWM-99-22X-FAL22 / AOC69W-DUP01-FAL22	680-224673-8 / 680-224673-5	C9-C18 Petroleum Hydrocarbons, Aliphatic	ND	ND	95.0	NA	30	NA	OK	
ZWM-99-22X-FAL22 / AOC69W-DUP01-FAL22	680-224673-8 / 680-224673-5	Chrysene	ND	ND	4.80	NA	30	NA	OK	
ZWM-99-22X-FAL22 / AOC69W-DUP01-FAL22	680-224673-8 / 680-224673-5	Dibenz(a,h)anthracene	ND	ND	4.80	NA	30	NA	OK	
ZWM-99-22X-FAL22 / AOC69W-DUP01-FAL22	680-224673-8 / 680-224673-5	Fluoranthene	ND	ND	4.80	NA	30	NA	OK	
ZWM-99-22X-FAL22 / AOC69W-DUP01-FAL22	680-224673-8 / 680-224673-5	Fluorene	ND	ND	4.80	NA	30	NA	OK	
ZWM-99-22X-FAL22 / AOC69W-DUP01-FAL22	680-224673-8 / 680-224673-5	Indeno(1,2,3-c,d)pyrene	ND	ND	4.80	NA	30	NA	OK	
ZWM-99-22X-FAL22 / AOC69W-DUP01-FAL22	680-224673-8 / 680-224673-5	Naphthalene	ND	ND	4.80	NA	30	NA	OK	
ZWM-99-22X-FAL22 / AOC69W-DUP01-FAL22	680-224673-8 / 680-224673-5	Phenanthrene	ND	ND	4.80	NA	30	NA	OK	
ZWM-99-22X-FAL22 / AOC69W-DUP01-FAL22	680-224673-8 / 680-224673-5	Pyrene	ND	ND	4.80	NA	30	NA	OK	

FD = Field Duplicate
 RL = Reporting Limit
 RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"

Field Duplicate Report By SDG

Former Fort Devens, Long Term Monitoring
Seres-Arcadis JV, Long Term Monitoring, AOC 69W, Fall 2022
Field Duplicates for SDG: 6802246731

Location	Analysis									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
ZWM-99-22X	SW6010C									
ZWM-99-22X-FAL22 / AOC69W-DUP01-FAL22	680-224673-8 / 680-224673-5	Iron (FLDFLT)	13000	13000	100	0.00	30	OK	NA	
ZWM-99-22X-FAL22 / AOC69W-DUP01-FAL22	680-224673-8 / 680-224673-5	Manganese (FLDFLT)	850	870	10.0	2.33	30	OK	NA	

Location	Analysis									
Field ID - Primary/Field Dup	Lab ID - Primary/Field Dup	Analyte	Primary Result	FD Result	RL	RPD	RPD Criteria	RPD Check	RL Check	
ZWM-99-22X	SW6020A									
ZWM-99-22X-FAL22 / AOC69W-DUP01-FAL22	680-224673-8 / 680-224673-5	Arsenic (FLDFLT)	170	160	5.00	6.06	30	OK	NA	

FD = Field Duplicate
RL = Reporting Limit
RPD = Relative Percent Difference

RL Check = If either the primary sample or field duplicate result is less than 5 times the RL then the criteria used to determine if the field duplicate is outside QC limits is +/- RL for Water and +/- 2 times RL for Soil"



LABORATORY DATA CONSULTANTS, INC.

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

ARCADIS U.S., Inc.
3109 West Martin Luther King Jr. Blvd, Suite 350
Tampa, FL 33607
ATTN: Mr. Nathan Mullens
nrmullens@seres-es.com

February 13, 2023

SUBJECT: Fort Devens - Data Validation

Dear Mr. Mullens,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on January 18, 2023. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #55942 F:

SDG #

680-224848-1

Fraction

Extractable Petroleum Hydrocarbons, Dissolved Metals

The data validation was performed under Stage 2B guidelines. The analysis was validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng

pgeng@lab-data.com

Project Manager/Senior Chemist

Data Validation Report for 6802248481

Facility: Former Fort Devens, Long Term Monitoring
 Event: Seres-Arcadis JV, Long Term Monitoring, AOC 69W, Fall 2022
 SDG: 6802248481
 Guidance Document: Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020
 Prime Contractor: Seres-Arcadis JV
 Project Manager: Jennifer Singer
 Contract Laboratory(ies): Eurofins Environment Testing TestAmerica, Savannah, GA | Eurofins Spectrum Analytical, Inc., North Kingston, RI
 Data Review Contractor: Laboratory Data Consultants, Inc.
 Data Review Level: 2B
 Primary Data Reviewer: Long Ngo, Environmental Scientist
 Second Reviewer: Pei Geng, Senior Scientist
 Date Submitted: February 13, 2023

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	MADEPEP	SW6010C - Dissolved	SW6020A - Dissolved
ZWM-95-18X-FAL22	680-224848-1	Water	Field Sample/N	X	X	X

Data Validation Report for 6802248481

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at 2B data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Quality Assurance Project Plan, Long Term Monitoring Program, Former Fort Devens, 2020 and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by Seres-Arcadis JV; analyses were performed by Eurofins Environment Testing TestAmerica, Savannah, GA | Eurofins Spectrum Analytical, Inc., North Kingston, RI and were reported under sample delivery group (SDG) 6802248481. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Blank - Negative
- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Interference Check Sample A
- Interference Check Sample A - Negative
- Interference Check Sample AB
- Lab Blank
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 1 results (4.35%) out of the 23 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Data Validation Report for 6802248481

Narrative Comments

Analytical Method	Data Reviewer Comment
MADEPEP	No additional comments; see Checklist for detail.
SW6010C	No additional comments; see Checklist for detail.
SW6020A	No additional comments; see Checklist for detail.



February 13, 2023

Reviewed by Long Ngo, Environmental Scientist, Laboratory Data Consultants, Inc.

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.



February 13, 2023

Reviewed by Pei Geng, Senior Scientist, Laboratory Data Consultants, Inc.

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Data Validation Report for 6802248481

Quality Control Outliers for test method MADEPEP, Lab Blank

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
MB620173051B (LB)	C11-C22 Petroleum Hydrocarbons, Aromatic Fraction, Adjusted for Target Analytes, Surrogates and Internal Standards	96.2	< 55	< 100	ug/l	U/None*	L	
MB620173051B (LB)	C19-C36 Petroleum Hydrocarbons, Aliphatic	66.9	< 14	< 100	ug/l	U/None*	L	
MB620173051B (LB)	C9-C18 Petroleum Hydrocarbons, Aliphatic	56.9	< 29	< 100	ug/l	U/None*	L	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

*Blank flags displayed in the above table identify qualification of the sample result when it is less than or equal to the LOQ/RL. Sample results above the LOQ will be qualified based on the validation type such as J+ at the sample result.

Qualified Results associated with the Lab Blank for MADEPEP

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
ZWM-95-18X-FAL22 680-224848-1	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	100	34.0 J M B	100 U		ug/l	L

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOD) or (LOQ) based on the sample concentration and the validation guidance. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 6802248481

Table of All Qualified Results

Test Method: MADEPEP		Extraction Method: SW3510C						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
ZWM-95-18X-FAL22 680-224848-1	N	C19-C36 Petroleum Hydrocarbons, Aliphatic	100	34.0 J M B	100 U		ug/l	L

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.

In instances where no LOD is provided, results are reported down to the LOQ.

Trace values are not included in the qualified results table unless additional reason codes are associated.

Data Validation Report for 6802248481

Results with Modified Qualifiers

No qualifiers associated with this sample delivery group were modified manually.

Reason Code Definitions

Code	Definition
L	Lab Blank
TR	Trace Level Detect

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Data Validation Report for 6802248481

Review Questions

Method: MADEPEP (Method for the Determination of Extractable Petroleum Hydrocarbons (EPH))				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Were the required minimum levels of calibration standards used in the initial calibration?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Were surrogate recoveries within project acceptance limits?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?		•		One result qualified U at the LOQ due to method blank contamination.
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were DoD QSM corrective actions followed if deviations were noted?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Data Validation Report for 6802248481

Review Questions

Method: SW6010C (Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?	•			
Were MS/MSD recoveries within project acceptance limits?	•			
Was the MS/MSD RPD within project acceptance limits?	•			
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Data Validation Report for 6802248481

Review Questions

Method: SW6020A (Trace Metals by Inductively Coupled Plasma/Mass Spectrometry)				
Review Questions	Yes	No	NA	Comment
Did Chain-of-Custody information agree with laboratory report and EDD for requested field samples and tests?	•			
Were samples preserved properly and received in good condition?	•			
Were holding times met?	•			
Were all requested target analytes reported?	•			
Was the Calibration within acceptance criteria?	•			
Was either analysis of an ICV performed after each ICAL or a second source standard prior to sample analysis?	•			
Were all reported analytes for the ICV within the required criteria?	•			
Were ICB/CCBs run at the required frequency?	•			
Were target analytes in the ICBs/CCBs non-detect?	•			
Was a method blank prepared and analyzed with each batch?	•			
Were target analytes in the method blank less than MDL?	•			
Were field blanks (EBs or FBs) submitted with these samples?			•	Not applicable to this method.
Were target analytes reported in the field blank(s) less than MDL?			•	Not applicable to this method.
Was an LCS/LCSD pair prepared and analyzed with each batch?	•			
Were LCS/LCSD recoveries within project acceptance limits?	•			
Was the LCS/LCSD RPD within project acceptance limits?	•			
Was a MS/MSD pair prepared with each batch?			•	Not applicable to this method.
Were MS/MSD recoveries within project acceptance limits?			•	Not applicable to this method.
Was the MS/MSD RPD within project acceptance limits?			•	Not applicable to this method.
If a field duplicate was analyzed, were the RPDs within QAPP acceptance limits?			•	Not applicable to this method.
Were QAPP specified laboratory LOQs/RLs achieved?	•			
Have all Laboratory Case Narrative comments/findings been addressed in the data review process?	•			
Were any data recommended for rejection (exclusion) in the data validation process?		•		Data acceptable as reported and qualified.

Appendix D

Summary of Historical Groundwater Sampling Results

Appendix D
 AOC 32/43A Exceedances Over Time, 2006 to 2022
 2022 Annual Operation, Maintenance, and Monitoring Report
 Main Post, Former Fort Devens Army Installation
 Devens, Massachusetts



Sample Location	Spring 2006	Fall 2006	Spring 2007	Fall 2007	Spring 2008	Fall 2008	Spring 2009	Fall 2009	Spring 2010	Fall 2010	Spring 2011	Fall 2011	Spring 2012	Fall 2012	Spring 2013	Fall 2013
Arsenic (Total) - 10 µg/L Cleanup Goal																
32M-01-18XBR	30	15	51	3.1 J	38	34	51	18	18	3.5 J	3.0 J	5.0	5.0	4.0 J	2.0 J	6.0
32M-01-14XOB	59	49	45	69	50	70	66	NS	43	NS	62	NS	80	NS	58	NS
Manganese (Total) - 3,500 µg/L Cleanup Goal																
32M-01-18XBR	18,000	16,000	18,200	10,200	14,800	18,900	29,400	6,970	2,360	4,510	2,300	1,150	4,100	1,540	270	137
32M-01-14XOB	2,800	3,200	1,500	3,420	2,760	5,050	3,660	NS	2,460	NS	1,740	NS	1,950	NS	1,650	NS
1,2-Dichlorobenzene - 600 µg/L Cleanup Goal																
32M-01-18XBR	5,900	2,800	6,100	690	2,700	4,100	1,700	730	300	570	340	260	640 J	340	7.46 J	7.30
1,3-Dichlorobenzene - 100 µg/L Cleanup Goal																
32M-01-18XBR	750	360	850	120	450	580	270	150	59	100	86	64	120 J	70	7.10 J	2.12 J
1,4-Dichlorobenzene - 5 µg/L Cleanup Goal																
32M-01-18XBR	490	210 J	550	67	270	390	180	100	26	62	50	37	69	42	1.2 J	1.1 J
32M-01-15XBR	ND	5.5	0.78 J	5.1 J	7.9	5.7 J	ND	ND	0.55 J	ND	ND	ND	ND	0.33 J	ND	ND
Chlorobenzene - 100 µg/L Monitoring Criteria																
32M-01-18XBR	900	480	1,200	110	850	1,600	540	200	88	210	78	49	280	82	0.88 J	0.97 J
VPH C₉- C₁₀ Aromatics - 200 µg/L Monitoring Criteria																
32M-01-18XBR	5,850	4,120	6,050	952	3,230	3,660	1,890	837	300	541	444	272	728	322	ND	ND

Notes:

100	= Above cleanup goal
100	= Above monitoring criteria

* = Spring 2015 and 2016 metals results are for dissolved metals.

Acronyms and Abbreviations:

- µg/L = microgram per liter
- AOC = Area of Contamination
- J = Estimated result
- NA = Not analyzed
- ND = non-detect
- NS = not sampled
- T/D = Total and dissolved metals results are reported for Spring 2017 results.
- VPH = volatile petroleum hydrocarbons

Appendix D
AOC 32/43A Exceedances Over Time, 2006 to 2022
2022 Annual Operation, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts



Sample Location	Spring 2014	Spring 2015*	Spring 2016*	Spring 2017 (T/D)	Spring 2018	Spring 2019	Fall 2019	Spring 2020	Spring 2021	Spring 2022
Arsenic (Total) - 10 µg/L Cleanup Goal										
32M-01-18XBR	3.0 J	4.0	2.8 J	4.7/2.4 J	6.5	3.4	NS	8.8	2.2 J	2.3 J
32M-01-14XOB	62	90	13	33	32	29	NS	31	56	29
Manganese (Total) - 3,500 µg/L Cleanup Goal										
32M-01-18XBR	1,990	1,720	1,100	2,300 / 2,700	8,400	2,200 J	NS	25,000	3,700	1,700
32M-01-14XOB	2,550	3,390	1,800	2,900 / 2,900	2,700	2,200	NS	1,900	2,000	770
1,2-Dichlorobenzene - 600 µg/L Cleanup Goal										
32M-01-18XBR	598	407	340	390	840	250 J	NS	1,500 J	130	160
1,3-Dichlorobenzene - 100 µg/L Cleanup Goal										
32M-01-18XBR	106	80	58	70	150	41 J	NS	250 J	24	27
1,4-Dichlorobenzene - 5 µg/L Cleanup Goal										
32M-01-18XBR	71	51	38	46	97	29 J	NS	170 J	18	18
32M-01-15XBR	ND	NS	NS	NS	NS	NS	ND	NS	NS	NS
Chlorobenzene - 100 µg/L Monitoring Criteria										
32M-01-18XBR	131	88	81	170	440	180 J	NS	970 J	190	160
VPH C₉- C₁₀ Aromatics - 200 µg/L Monitoring Criteria										
32M-01-18XBR	730	360	450	410	760	160 J	NS	1,000 J	120	210

Notes:

100	= Above cleanup goal
100	= Above monitoring criteria

* = Spring 2015 and 2016 metals results are for dissolved metals.

Acronyms and Abbreviations:

- µg/L = microgram per liter
- AOC = Area of Contamination
- J = Estimated result
- NA = Not analyzed
- ND = non-detect
- NS = not sampled
- T/D = Total and dissolved metals results are reported for Spring 2017 results.
- VPH = volatile petroleum hydrocarbons

Sample Location	Fall 1999	Fall 2000	Fall 2001	Fall 2002	Fall 2003	Fall 2004	Fall 2005	Fall 2006	Fall 2007	Fall 2008	Fall 2009	Fall 2010	Fall 2011	Fall 2012	Fall 2013	Fall 2014	Fall 2015	Fall 2016	Fall 2017	Fall 2018	Fall 2019	Fall 2020	Fall 2021	Fall 2022
Benzene - 5 µg/L Cleanup Goal																								
AAFES-2	62	36	43	26	9.0	6.6	6.1	1.3	ND	ND	3.93 J	ND	ND	6.60 J	5.04	3.7	4.2	ND	ND	ND	1.5 J	ND	ND	ND
XGM-93-02X	81	32	12	140	24	39	29	18.5	8.8	2.6	0.997 J	ND	ND	ND	ND	0.77 J	ND	ND	0.38 J	0.60 J	ND	ND	ND	ND
XGM-97-12X	270	550	700	780	290	260	35.6	129	22.8	13.7 J	27.4 J	ND	13.8	3.03 J	3.87	1.5	3.8	ND	ND	4.0	ND	ND	ND	ND
Iron, total - 9,100 µg/L Cleanup Goal																								
AAFES-2	24,000	20,000	27,000	26,000	14,000	20,000	21,900	12,000	20,000	18,000	16,000	14,000	22,000	18,000	19,000	19,400	14,400	11,000	10,000	19,000	20,000	17,000	17,000	14,000
AAFES-6/6R	11,000	9,200	13,000	9,400	NS	NS	NS	11,000	11,000	6,500	4,300	3,300	1,100	6,900	9,200	8,240	NS	NS	NS	NS	NS	NS	NS	NS
XGM-93-02X	30,000	18,000	11,000	24,000	15,000	28,000	11,500	13,000	5,800	11,000	8,500	11,000	12,000	6,000	10,000	9,580	13,200	6,000	6,500	20,000	9,300	6,400	6,200	4,400
XGM-94-07X	3,500	2,900	5,800	2,300	1,000	300	1,610	1,400	4,500	9,300	8,800	12,000	13,000	23,000	10,000	6,820	NS	NS	NS	NS	8,300	12,000	NS	NS
XGM-94-08X	4,800	13,000	4,500	4,600	3,200	2,500	4,520	6,100	4,600	2,200	1,300	1,000	750	2,300	910	147	NS	NS	NS	NS	1,000	11,000	NS	NS
XGM-97-12X	32,000	26,000	33,000	46,000	33,000	32,000	20,100	18,000	22,000	25,000	25,000	16,000	27,000	20,000	24,000	25,800	34,300	25,000	18,000	27,000	6,200	18,000	28,000	16,000
Manganese, total - 375 µg/L Cleanup Goal																								
AAFES-2	4,600	3,900	4,800	3,700	3,100	4,000	3,590	2,700	3,790	3,600	3,320	2,490	3,700	3,100	3,270	3,460	2,740	2,800	2,800	3,100	3,500	3,200	2,500	2,600
AAFES-6/6R	2,900	9,200	3,400	3,000	NS	NS	NS	2,900	3,090	3,630	907	1,670	1,830	3,220	2,820	3,000	NS	NS	NS	NS	NS	NS	NS	NS
AAFES-7	NS	NS	NS	NS	NS	NS	NS	NS	NS	106	81	79	5 J	706	2,390	1,640	139	510	330	NS	86	3,400	47	77
XGM-93-02X	3,900	2,500	1,900	2,500	1,900	2,600	1,450	2,000	1,800	1,420	1,630	737	3,020	612	1,180	1,570	2,020	1,400	1,400	1,900	1,300	1,200	1,300	1,000
XGM-94-04X	2,900	2,200	3,400	2,000	1,400	1,400	1,580	1,100	559	68	2,730	6,490	2,140	2,580	2,730	1,510	1,090	1,500	1,700 J	230	5,500	13	290	5,600
XGM-94-06X	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	1,400	1,800	NS	NS
XGM-94-07X	5,700	3,700	6,100	4,500	3,600	1,000	6,120	5,100	4,120	5,100	4,990	3,870	6,060	5,560	5,380	6,940	NS	NS	NS	NS	4,200	4,500	NS	NS
XGM-94-08X	4,500	4,600	4,900	3,600	3,600	3,800	7,260	4,200	3,380	3,100	2,150	2,070	2,780	4,620	2,300	3,210	NS	NS	NS	NS	3,500	7,100	NS	NS
XGM-97-12X	6,300	4,100	4,200	3,900	4,100	3,000	437	1,800	2,070	3,060	2,390	2,110	3,540	1,640	1,680	2,080	3,460	1,700	1,200	3,800	250	1,300	1,700	1,100
C₅-C₈ Aliphatics - 300 µg/L Monitoring Criteria																								
AAFES-2	ND	1,400	ND	1,200	1,200	ND	2,070	1,430	1,400	ND	ND	859	1,270	1,560 J	1,390	1,250	728	850	890	480 J	1,200	480	750	610
AAFES-6/6R	370	420	290	ND	NS	NS	NS	305	ND	ND	ND	114	ND	215	287	188	NS	NS	NS	NS	NS	NS	NS	NS
XGM-93-02X	ND	570	270	790	410	ND	788	519	ND	ND	ND	124	ND	65	268	101	94	79 J	84 J	210	150	130	110	
XGM-94-04X	ND	420	140	ND	ND	ND	ND	ND	ND	ND	ND	533	765	497 J	1,140	186	65	480	360	ND	590	ND	ND	260
XGM-97-12X	970	1,300	1,100	1,100	1,100	ND	2,370	1,740	1,230	ND	4,050	644	367	507 J	494	272	515	420	350	360	350	110	480	190
C₉-C₁₂ Aliphatics - 700 µg/L Monitoring Criteria																								
AAFES-2	ND	81	ND	200	ND	57	5,220	987	1,000	1,020	950	768	1,080	542 J	1,650	688	85.7	430	530 J	330 J	790	820	750	1,100
XGM-93-02X	ND	39	ND	58	33	34	1,570	268	94	182	55.5	ND	85.1	ND	100	76.6	ND	56	78 J	ND	79 J	66 J	94 J	ND
XGM-97-12X	96	ND	ND	130	ND	90	7,310	1,340	1,080	2,210	1,450	922	535	275 J	724	162	718	230	170 J	420 J	150 J	300	1,400	ND
C₉-C₁₀ Aromatics - 200 µg/L Monitoring Criteria																								
AAFES-2	9,400	7,200	5,300	13,000	6,600	6,700	3,130	3,710	2,420	2,120	2,660	1,870	1,050	1,090	1,940	1,090	827	730	1,100 J	990	1,400	820	580	530
XGM-93-02X	510	2,300	1,100	3,600	1,600	3,700	918	766	228	325	110	73.4	ND	ND	ND	113	62.3	ND	ND	75 J	100	66.0 J	ND	ND
XGM-94-04X	200	570	170	28	ND	ND	ND	ND	ND	ND	ND	243	469	300 J	769	76.8	ND	320	410 J	ND	830	ND	ND	190
XGM-97-12X	4,500	5,500	5,400	7,500	8,700	7,400	3,810	4,010	4,220	5,260	4,110	2,470 J	463	367 J	840	253	1,560	340	430 J	1,000	340	300	1,000	160

Notes:

100	= Above cleanup goal
100	= Above monitoring criteria

- The cleanup goal for iron is the background level. The cleanup goal for manganese is a site-specific goal determined in 2008 (Long-Term Monitoring Plan Former Fort Devens Army Installation, HGL, 2008).
- The VPH carbon ranges are not contaminants of concern and are evaluated against MCP GW-1 standards for comparison purposes. Benzene, ethylbenzene, xylenes, and toluene are not contaminants of concern but the cleanup goals are the Maximum Contaminant Levels.

Acronyms and Abbreviations:

- µg/L = microgram per liter
- AOC = Area of Contamination
- B = Blank Qualified
- J = Estimated result
- MCP = Massachusetts Contingency Plan
- ND = Non-detect
- NS = not sampled
- VPH = volatile petroleum hydrocarbons

Sample Location	Fall 2003	Spring 2004	Fall 2004	Spring 2005	Fall 2005	Spring 2006	Fall 2006	Spring 2007	Fall 2007	Spring 2008	Spring 2009	Spring 2010	Spring 2011	Spring 2012	Spring 2013	Spring 2014	Spring 2015	Spring 2016	Spring 2017	Spring 2018	Spring 2019	Spring 2020	Spring 2021	Spring 2022
Groundwater																								
Arsenic (Total) - 10 µg/L Cleanup Goal																								
57M-95-03X	36	44	230	25	13.6	7.0	49	4.8	51	23	21	23	58	36	60	60	38	31	27	42	15	42	25	26
57M-96-11X	270	240	120	161	215	163	171	166	193	160	163	148	190	192	181	160	284	290	180	180	100	300 J	470	280
Surface Water																								
Iron (Dissolved) - 1,000 µg/L Surface Water Benchmark																								
57-SW-1	NA	NA	NA	NA	NA	600	4,500	520	7,100	6,800	2,500	240	20,000	8,300	10,000	10,000	4,140	19,000	21,000	4,000	760	490	12,000	1,900

Notes:
100 = Above cleanup goal and/or benchmark

Acronyms and Abbreviations:
µg/L = microgram per liter
AOC = Area of Contamination
J = Estimated result
NA = Not analyzed
ND = non-detect

Appendix D
AOC 69W Exceedances Over Time, 2000 to 2022
2022 Annual Operation, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts



Sample Location	Spring 2000	Fall 2000	Spring 2001	Fall 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004	Fall 2004	Spring 2005	Fall 2005	Spring 2006	Fall 2007	Fall 2008
Arsenic, dissolved - 10 µg/L Cleanup Goal															
69W-94-13	54	110	85	150	52	130	35	69	27	88	56	60	69	142	73
ZWM-95-15X	ND	7.9	ND	22	36	40	ND	16	7.7	30	ND	ND	ND	16	ND
ZWM-99-22X	150	130	230	140	86	140	150	160	140	140	120	120	159	244	223
ZWM-99-23X	23	70	67	55	15	ND	27	ND	44	61	46	47	56	56	52
ZWM-01-25X	NA	NA	NA	4.1 J	ND	ND	2.3 J	ND	ND	3.4 J	ND	ND	3 J	5	2.3 J
Manganese, dissolved - 375 µg/L Monitoring Criteria															
69WP-08-01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	174
69W-94-13	2,300	1,700	1,500	1,600	2,100	2,400	2,800	4,100	2,500	1,300	3,000	1,600	2,600	1,120	1,940
ZWM-95-15X	28	1,300	25	100	1,500	2,200	1,600	970	4,600	980	850	130	860	1,230	438
ZWM-99-22X	2,000	1,800	2,300	2,400	2,000	1,500	2,700	2,300	3,100	1,900	3,400	3,200	3,700	3,120	3,790
ZWM-99-23X	4,200	3,600	5,800	1,500	550	1,700	5,300	4,300	2,500	2,300	5,200	2,500	2,700	1,320	2,500
ZWM-01-25X	NA	NA	NA	280	61	1,000	89	230	140	300	140	490	1,400	3,210	1,320
EPH C₁₁-C₂₂ Aromatics - 200 µg/L Monitoring Criteria															
69W-94-13	690	1,400	720	790	1,900	290	ND	160	ND	110	ND	ND	209	311	152
ZWM-99-22X	2,500	1,400	2,100	370	620	210	380	330	270	400	320	280	627	166	356
ZWM-99-23X	170	520	200	140	140	ND	ND	ND	ND	ND	ND	ND	174	107	80

Notes:

100	= Above cleanup goal
100	= Above monitoring criteria

Acronyms and Abbreviations:

- µg/L = microgram per liter
- AOC = Area of Contamination
- EPH = extractable petroleum hydrocarbons
- J = Estimated result
- NA = Not analyzed
- ND = non-detect

Appendix D
AOC 69W Exceedances Over Time, 2000 to 2022
2022 Annual Operation, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts



Sample Location	Fall 2010	Fall 2011	Fall 2012	Fall 2013	Fall 2014	Fall 2015	Fall 2016	Fall 2017	Fall 2018	Fall 2019	Fall 2020	Fall 2021	Fall 2022
Arsenic, dissolved - 10 µg/L Cleanup Goal													
69W-94-13	127	120	115	73	101	120	76	24	35	70	32	19	15
ZWM-95-15X	13	41	23	17	30.2	19.3	3.7	10	18	17	7.0	22	8.9
ZWM-99-22X	343	367	299	233 J	172	125	150	190	150	150	130	140	170
ZWM-99-23X	15	60	29	27	19.5	13.9	7.7	17	39	24	5.3	32	6.1
ZWM-01-25X	ND	13	19	5	ND	ND	ND	4.5	NA	ND	2.9 J	ND	ND
Manganese, dissolved - 375 µg/L Monitoring Criteria													
69WP-08-01	78	2,190	904	237	64.5	78.4	79	33	35	1,300	360	670	1,400
69W-94-13	1,360	1,840	1,400	1,730	1,940	2,050	2,600	320	1,600	1,600	970	880	590
ZWM-95-15X	1,120	1,010	1,580	1,280	900	843	17	220	340	690 J	360	2,100	790
ZWM-99-22X	1,750	2,160	1,120	998	1,280	1,440	960	1,200	1,500	1,100	910	1,300	850
ZWM-99-23X	523	1,720	500	556	533	749	590	1,800	1,600	770	110	1,500	220
ZWM-01-25X	1,490	2,820	2,540	1,570	435	859	78	590	NA	6,200	1,700	540	560
EPH C₁₁-C₂₂ Aromatics - 200 µg/L Monitoring Criteria													
69W-94-13	339	242	379	227	252	175	410	ND	98	77 J	50 J	ND	ND
ZWM-99-22X	209	327	308	286	332	354	210	170	230	220	78 J	ND	ND
ZWM-99-23X	ND	ND	ND	ND	ND	ND	110	ND	130	ND	ND	ND	ND

Notes:

100	= Above cleanup goal
100	= Above monitoring criteria

Acronyms and Abbreviations:

- µg/L = microgram per liter
- AOC = Area of Contamination
- EPH = extractable petroleum hydrocarbons
- J = Estimated result
- NA = Not analyzed
- ND = non-detect

Appendix D
DCL Historical Groundwater Data, Well LFM-99-02B
2022 Annual Operation, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts



LFM-99-02B	Units	Monitoring Criteria	Spring 2003	Fall 2003	Spring 2004	Fall 2004	Spring 2005	Fall 2005	Spring 2006	Spring 2007	Spring 2008	Fall 2008	Spring 2009	Fall 2009
Extractable Petroleum Hydrocarbons (EPH)														
Naphthalene	µg/L	140	1.0 U	5.1 U	2.4 U	2.1 U	10.0 U	0.400 U	0.2 U	0.46 U	0.412 U	0.430 U	10 U	NA
Pesticides														
Aldrin	µg/L	0.50	0.0064 U	0.0067 U	0.0076 U	0.0076 U	0.05 UJ	0.200 UJ	0.05 U	0.0217 U	0.021 UJ	0.021 UJ	0.200 UJ	NA
Dieldrin	µg/L	0.10	0.013 U	0.0013 U	0.015 U	0.014 U	0.1 U	0.040 UJ	0.05 U	0.0435 U	0.043 UJ	0.042 UJ	0.040 UJ	NA
alpha-Chlordane	µg/L	2.0	0.0064 U	0.0067 U	0.0076 U	0.071 U	0.05 U	0.020 UJ	0.05 U	0.0217 U	0.021 UJ	0.021 UJ	0.020 UJ	NA
gamma-Chlordane	µg/L	2.0	0.0064 U	0.0053 J	0.0076 U	0.071 U	0.05 U	0.020 UJ	0.05 U	0.0217 U	0.021 UJ	0.021 UJ	0.020 UJ	NA
Chlordane	µg/L	2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
gamma-BHC (Lindane)	µg/L	0.20	0.0064 U	0.0067 U	0.0076 U	0.0076 U	0.05 U	0.020 UJ	0.05 U	0.0217 U	0.021 UJ	0.021 UJ	0.020 UJ	NA
Metals														
Arsenic, Total	µg/L	10	5.0 U	50.0 U	5.0 U	5.0 U	4.2 U	5.0 J	2.5 U	5.0 U	5.0 U	5.0 U	5 U	5 U
Chromium, Total	µg/L	100	28	1.7 J	0.96 J	1.07 J	12.0 U	NA	10.0 U	10.0 U	10 U	10 U	5 U	40
Iron, Total	µg/L	NS	NA	100 U	17 J	100 U	38.0 U	32 J	50.0 U	50.0 U	50 U	28 J	50 U	380
Lead, Total	µg/L	15	5.0 U	8.5 J	5.0 U	5.0 U	3.1	10 U	2.5 U	10.0 U	10 U	10 U	10 J	10 U
Manganese, Total	µg/L	NS	NA	2.4 J	1.5 J	12.7 J	5.2 J	10 U	10.0 U	1.1 J	10 U	10 U	10 U	9.1 J
General Chemistry														
Total Cyanide	mg/L	0.20	0.01 U	0.004 J	0.01 U	0.005 J	0.01 U	0.005 U	0.05 U	0.01 U	0.005 U	0.005 U	0.005 U	NA
Nitrate/Nitrite (as N)	mg/L	NS	0.21	1.4	0.66	0.796	0.36 J	0.64 U	0.45	0.5	0.43 J	1.9	0.92	NA
Chemical Oxygen Demand	mg/L	NS	170	50.0 U	15 J	50.0 U	20.0 U	20 U	10.0 U	20.0 U	20 U	12 J	20 U	NA
Water Quality Parameters														
pH	std	NS	6.20	6.38	6.09	6.38	5.97	6.17	6.32	6.15	6.32	7.00	5.57	6.22
Oxidation-Reduction Potential	mV	NS	NA	204.7	243.3	308.4	266.3	311.3	223.6	200.8	160.7	55.2	215.4	113
Turbidity	NTU	NS	NA	0.40	0.80	0.55	0.37	3.8	0.18	0.00	2.80	2.0	0.0	0.0

Acronyms and Abbreviations:

- µg/L = microgram per liter
- DCL = Devens Consolidation Landfill
- J = Estimated result
- mg/L = milligram per liter
- mV = millivolts
- NA = Not analyzed
- ND = non-detect
- NS = No Standard
- NTU - Nephelometric Turbidity Unit
- Q = Qualifier
- R = Data were rejected
- U = The target analyte was not detected at or above the laboratory reporting limit.
- UJ = Estimated non-detect

Appendix D
DCL Historical Groundwater Data, Well LFM-99-02B
2022 Annual Operation, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts



LFM-99-02B	Units	Monitoring Criteria	Spring 2010	Fall 2010	Spring 2011	Fall 2011	Spring 2012	Fall 2012	Spring 2013	Fall 2013	Spring 2014	Fall 2014	Spring 2015	Fall 2015	Spring 2016
Extractable Petroleum Hydrocarbons (EPH)															
Naphthalene	µg/L	140	0.419 U	0.400 U	0.400 U	0.400 U	0.400 U	0.148 J	0.400 U	0.400 U	0.400 U	1.0 U	5.100 U	4.300 U	2.0 U
Pesticides															
Aldrin	µg/L	0.50	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.010 U	0.026 U	0.051 U	0.013 U
Dieldrin	µg/L	0.10	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.010 U	0.026 U	0.051 U	0.007 U
alpha-Chlordane	µg/L	2.0	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.054 U	NA	NA	NA
gamma-Chlordane	µg/L	2.0	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.054 U	NA	NA	NA
Chlordane	µg/L	2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.130 U	0.530 U	0.16 U
gamma-BHC (Lindane)	µg/L	0.20	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.011 U	0.026 U	0.051 U	0.007 U
Metals															
Arsenic, Total	µg/L	10	5 U	5 U	5 U	2 J	5 U	5 U	5 U	5 U	3 U	3 U	2.0 U	4.0 U	3.0 U
Chromium, Total	µg/L	100	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	5.0 U	10 U	4.0 U
Iron, Total	µg/L	NS	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	100 U	50 U
Lead, Total	µg/L	15	10 U	10 U	10 U	3 J	10 U	10 U	10 U	10 U	10 U	10 U	2.5 U	5.0 U	10 U
Manganese, Total	µg/L	NS	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	7.5 U	15 U	3.0 U
General Chemistry															
Total Cyanide	mg/L	0.20	0.0011 J	0.005 U	0.005 U	0.005 U	0.002 J	0.0020 J	0.005 U	0.005 U	0.0001 J	0.0041 U	0.0011 U	0.0082 J	0.005 U
Nitrate/Nitrite (as N)	mg/L	NS	0.41	0.54	0.43	0.76	0.22 U	0.49	0.069 J	0.51	0.52	0.36	0.390	0.630	0.60
Chemical Oxygen Demand	mg/L	NS	20	20 U	8 J	20 U	20 U	20 U	15 J	20 U	4.1 J	10 U	15 U	20 U	10 U
Water Quality Parameters															
pH	std	NS	6.71	6.35	6.10	6.03	6.25	6.29	5.87	6.45	6.00	6.51	6.07	---	6.16
Oxidation-Reduction Potential	mV	NS	-232.2	163.6	150.1	142.2	135.5	196.3	303.3	101.8	200.3	113.3	248.5	---	197.0
Turbidity	NTU	NS	2.2	0.39	0.00	2.57	0.33	0.00	0.00	0.79	0.69	0.88	1.65	---	0.36

Acronyms and Abbreviations:

- µg/L = microgram per liter
- DCL = Devens Consolidation Landfill
- J = Estimated result
- mg/L = milligram per liter
- mV = millivolts
- NA = Not analyzed
- ND = non-detect
- NS = No Standard
- NTU - Nephelometric Turbidity Unit
- Q = Qualifier
- R = Data were rejected
- U = The target analyte was not detected at or above the laboratory reporting limit.
- UJ = Estimated non-detect

Appendix D
DCL Historical Groundwater Data, Well LFM-99-02B
2022 Annual Operation, Maintenance, and Monitoring Report
Main Post, Former Fort Devens Army Installation
Devens, Massachusetts



LFM-99-02B	Units	Monitoring Criteria	Fall 2016	Spring 2017	Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021	Fall 2021	Spring 2022	Fall 2022
Extractable Petroleum Hydrocarbons (EPH)															
Naphthalene	µg/L	140	2.3 U	1.9 U	1.9 U	1.9 U	1.4 U	1.6 U	1.5 U	1.4 U	1.4 U	R	2.5 U	1.4 U	1.4 U
Pesticides															
Aldrin	µg/L	0.50	0.019 U	0.017 U	0.017 U	0.019 UJ	0.017 UJ	0.0086 UJ	0.0089 U	0.0086 UJ	0.003 U	0.0086 U	0.0073 U	0.0074 U	0.0037 U
Dieldrin	µg/L	0.10	0.010 U	0.0096 U	0.0096 U	0.0110 UJ	0.0096 UJ	0.0048 U	0.0049 U	0.0048 U	0.0018 U	0.0086 U	0.0048 U	0.0049 U	0.0037 U
alpha-Chlordane	µg/L	2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
gamma-Chlordane	µg/L	2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlordane	µg/L	2.0	0.31 U	0.29 U	0.29 U	0.32 UJ	0.29 UJ	0.14 U	0.15 U	0.14 U	0.05 U	0.14 U	0.14 U	0.14 U	0.37 U
gamma-BHC (Lindane)	µg/L	0.20	0.010 U	0.0096 U	0.0096 U	0.0110 UJ	0.0096 UJ	0.0048 U	0.0049 U	0.0048 U	0.0017 U	0.0048 U	0.0048 U	0.0049 U	0.0037 U
Metals															
Arsenic, Total	µg/L	10	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Chromium, Total	µg/L	100	6.0 J	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	5.0 U	4.0 U
Iron, Total	µg/L	NS	28	50 U	75 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Lead, Total	µg/L	15	10 U	10 U	2.5 U	10 U	15 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	20 U
Manganese, Total	µg/L	NS	2.0 J	3.0 U	5.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	5.0 U	5.0 J
General Chemistry															
Total Cyanide	mg/L	0.20	0.0082 J	0.005 U	0.005 U	0.0048 J	0.0044 J	0.005 U	0.0026 J	0.0027 J	0.0025	0.0045 J	0.005 U	0.0074 J	0.0064 J
Nitrate/Nitrite (as N)	mg/L	NS	0.630	0.47	0.78	0.60	0.69	0.28	0.55 J	0.47	0.38	1.0	0.48	0.38	0.53
Chemical Oxygen Demand	mg/L	NS	20 U	5.4 J	10 U	10 J	10 U	20 U	40 U	20 U	17 U	20 U	12 J	10 J	14 J
Water Quality Parameters															
pH	std	NS	6.44	6.55	6.72	6.27	5.95	6.4	6.4	5.97	6.68	6.39	6.19	8.85	6.48
Oxidation-Reduction Potential	mV	NS	77.8	172.6	111.1	80.9	226	210	190	320	110	289	95	254	231
Turbidity	NTU	NS	1.73	7.57	2.59	2.91	2.47	0.75	0.52	0.420	2.22	0.59	0.02	1.08	2.70

Acronyms and Abbreviations:

- µg/L = microgram per liter
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- U = The target analyte was not detected at or above the laboratory reporting limit.
- UJ = Estimated non-detect

Appendix E

Mann-Kendall Data Trend Analyses

AOC 57

AOC 57
Total Arsenic

Mann-Kendall Trend Test for 57M-95-03X - Total Arsenic



Mann-Kendall Trend Analysis

n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.2534
Standardized Value of S	-0.2981
M-K Test Value (S)	-13
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.3828

OLS Regression Line (Blue)

OLS Regression Slope	-1.7252
OLS Regression Intercept	3,513.8221

Insufficient statistical evidence of a significant trend at the specified level of significance.

Mann-Kendall Trend Test for 57M-96-11X - Total Arsenic



Mann-Kendall Trend Analysis	
n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.2782
Standardized Value of S	0.7448
M-K Test Value (S)	31
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.2282

OLS Regression Line (Blue)
OLS Regression Slope 4.1844
OLS Regression Intercept -8,218.3610

Insufficient statistical evidence of a significant trend at the specified level of significance.

AOC 69W

AOC 69W
Dissolved Arsenic

Mann-Kendall Trend Test for 69W-94-13 - Dissolved Arsenic

Mann-Kendall Trend Analysis

n	29
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	53.2729
Standardized Value of S	-1.4078
M-K Test Value (S)	-76
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0796

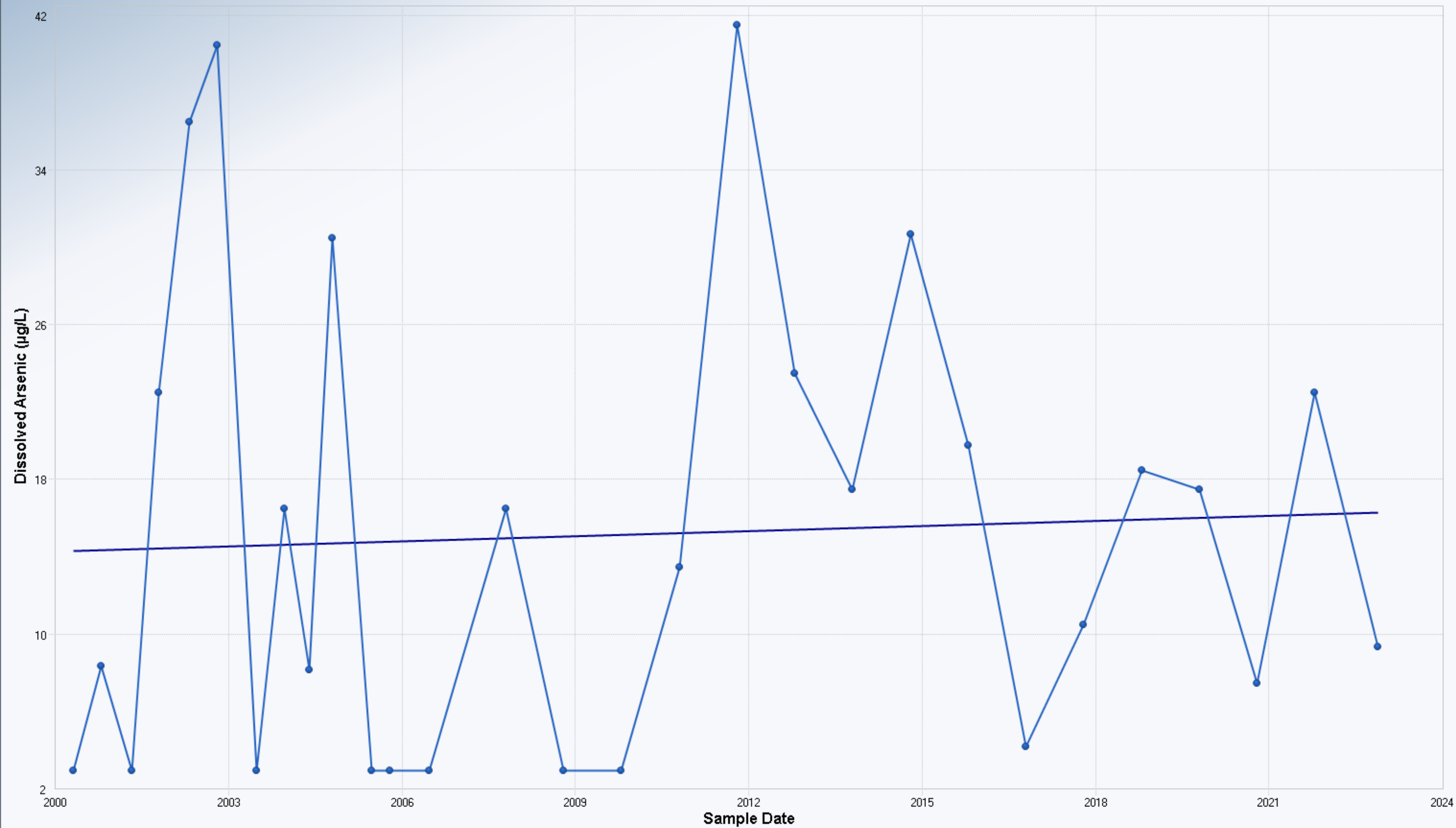
OLS Regression Line (Blue)

OLS Regression Slope	-1.8386
OLS Regression Intercept	3,771.7204

Insufficient statistical evidence of a significant trend at the specified level of significance.



Mann-Kendall Trend Test for ZWM-95-15X - Dissolved Arsenic



Mann-Kendall Trend Analysis	
n	29
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	52.6656
Standardized Value of S	0.8734
M-K Test Value (S)	47
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.1912

OLS Regression Line (Blue)	
OLS Regression Slope	0.0873
OLS Regression Intercept	-160.8649

Insufficient statistical evidence of a significant trend at the specified level of significance.

Mann-Kendall Trend Test for ZWM-99-22X -Dissolved Arsenic



Mann-Kendall Trend Analysis

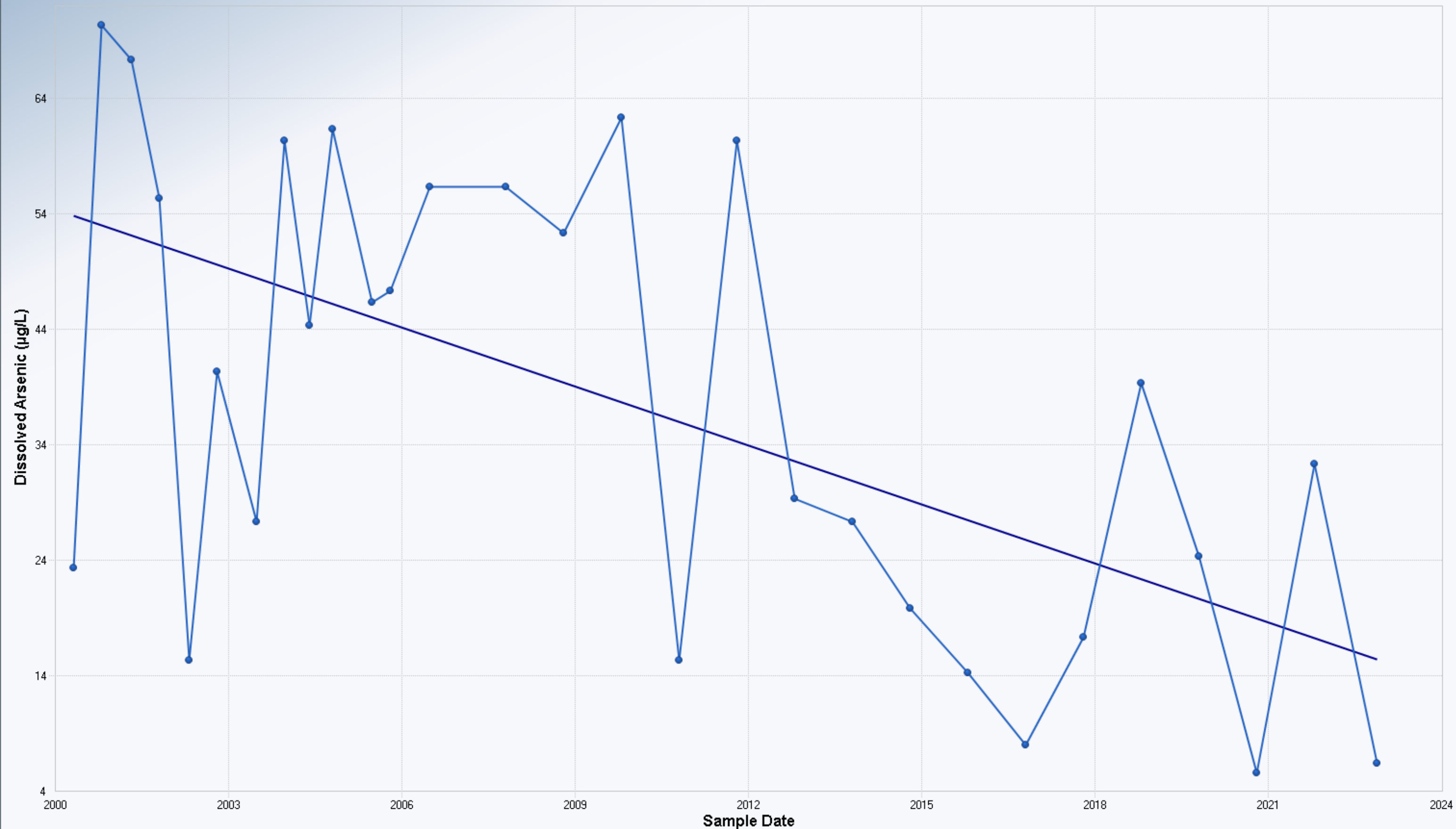
n	29
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	52.9780
Standardized Value of S	0.8872
M-K Test Value (S)	48
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.1875

OLS Regression Line (Blue)

OLS Regression Slope	1.0794
OLS Regression Intercept	-1,985.0049

Insufficient statistical evidence of a significant trend at the specified level of significance.

Mann-Kendall Trend Test for ZWM-99-23X - Dissolved Arsenic



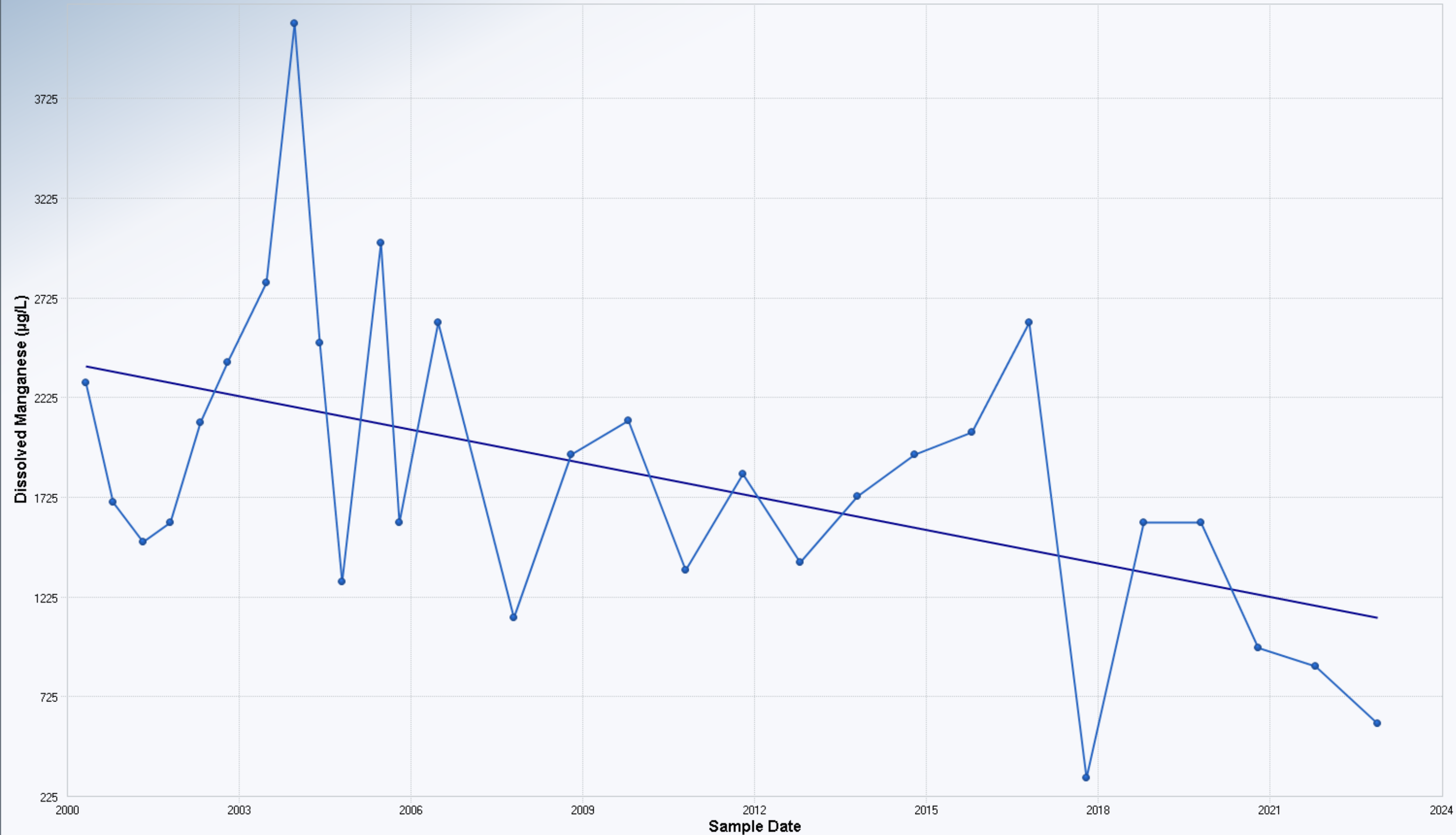
Mann-Kendall Trend Analysis	
n	29
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	53.2729
Standardized Value of S	-2.8345
M-K Test Value (S)	-152
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0023

OLS Regression Line (Blue)	
OLS Regression Slope	-1.7006
OLS Regression Intercept	3,455.2600

Statistically significant evidence of a decreasing trend at the specified level of significance.

AOC 69W
Dissolved Manganese

Mann-Kendall Trend Test for 69W-94-13 - Dissolved Manganese



Mann-Kendall Trend Analysis

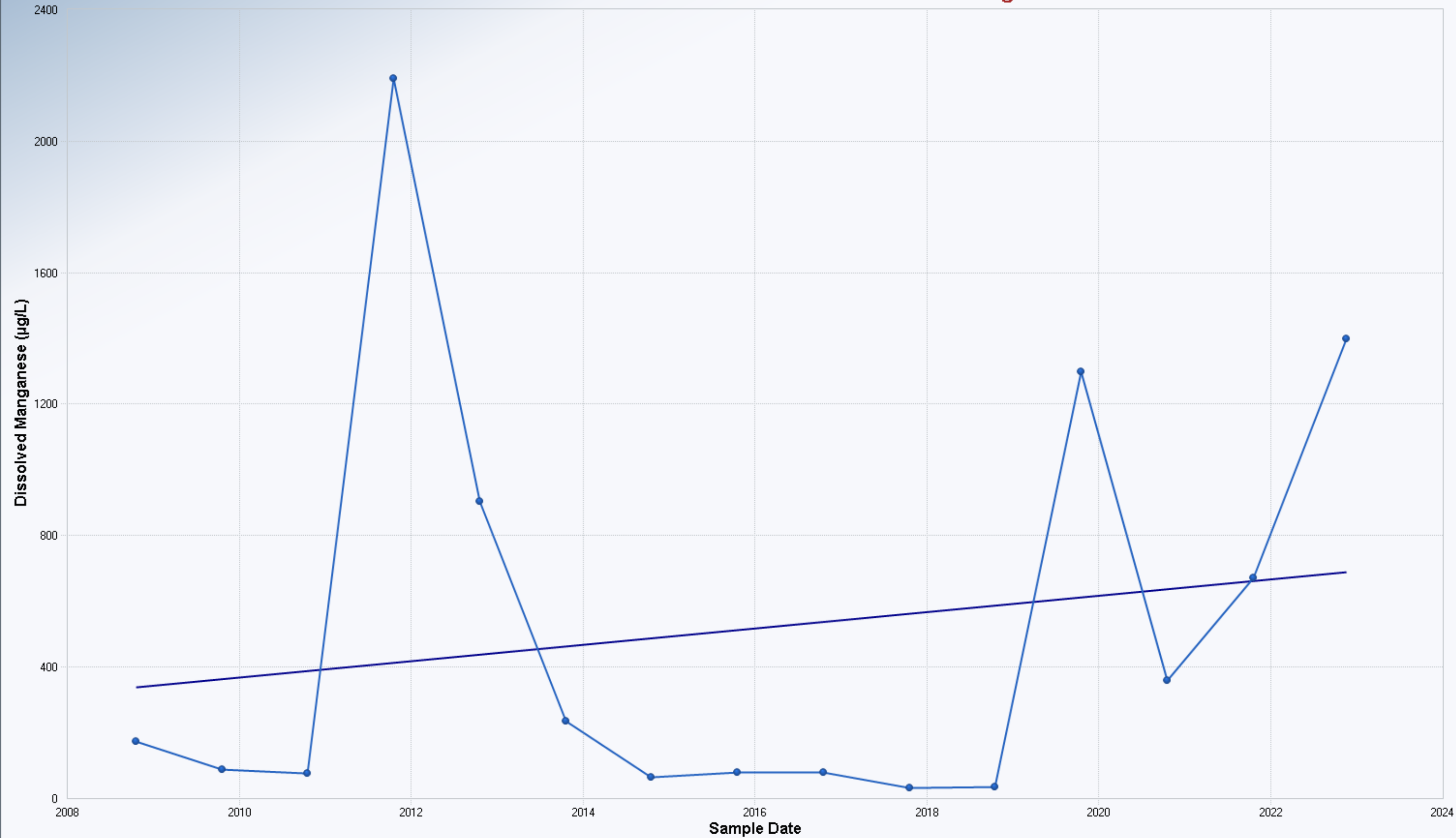
n	29
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	53.2103
Standardized Value of S	-2.3116
M-K Test Value (S)	-124
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0104

OLS Regression Line (Blue)

OLS Regression Slope	-55.8992
OLS Regression Intercept	114,201.3319

Statistically significant evidence of a decreasing trend at the specified level of significance.

Mann-Kendall Trend Test for 69WP-08-01 - Dissolved Manganese



Mann-Kendall Trend Analysis

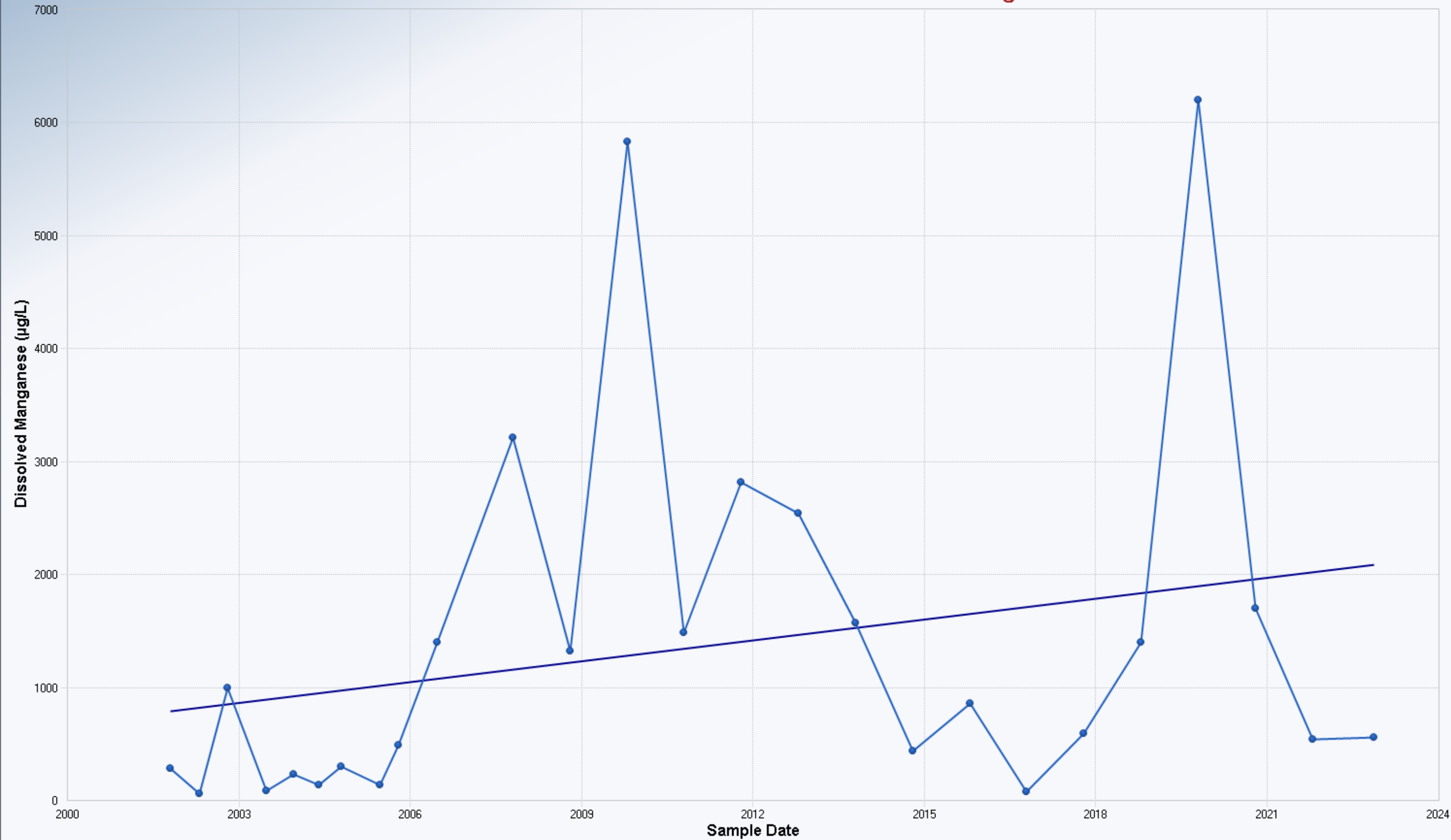
n	15
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	20.2073
Standardized Value of S	0.3959
M-K Test Value (S)	9
Tabulated p-value	0.3490
Approximate p-value	0.3461

OLS Regression Line (Blue)

OLS Regression Slope	24.8589
OLS Regression Intercept	-49,597.8674

Insufficient statistical evidence of a significant trend at the specified level of significance.

Mann-Kendall Trend Test for ZWM-01-25X - Dissolved Manganese

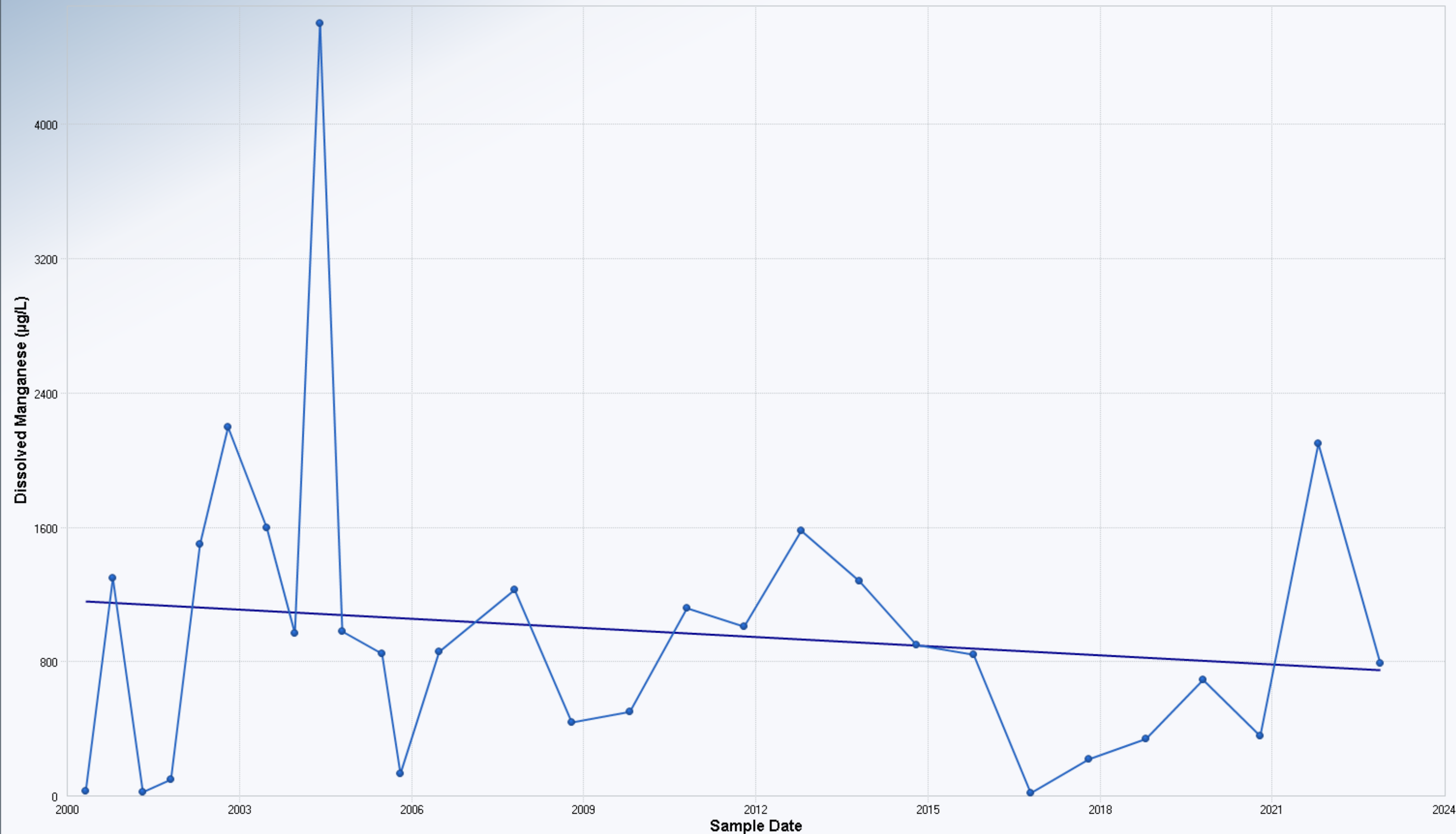


Mann-Kendall Trend Analysis	
n	26
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	45.3468
Standardized Value of S	2.1170
M-K Test Value (S)	97
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0171

OLS Regression Line (Blue)	
OLS Regression Slope	61.2916
OLS Regression Intercept	-121,901.3050

Statistically significant evidence of an increasing trend at the specified level of significance.

Mann-Kendall Trend Test for ZWM-95-15X - Dissolved Manganese

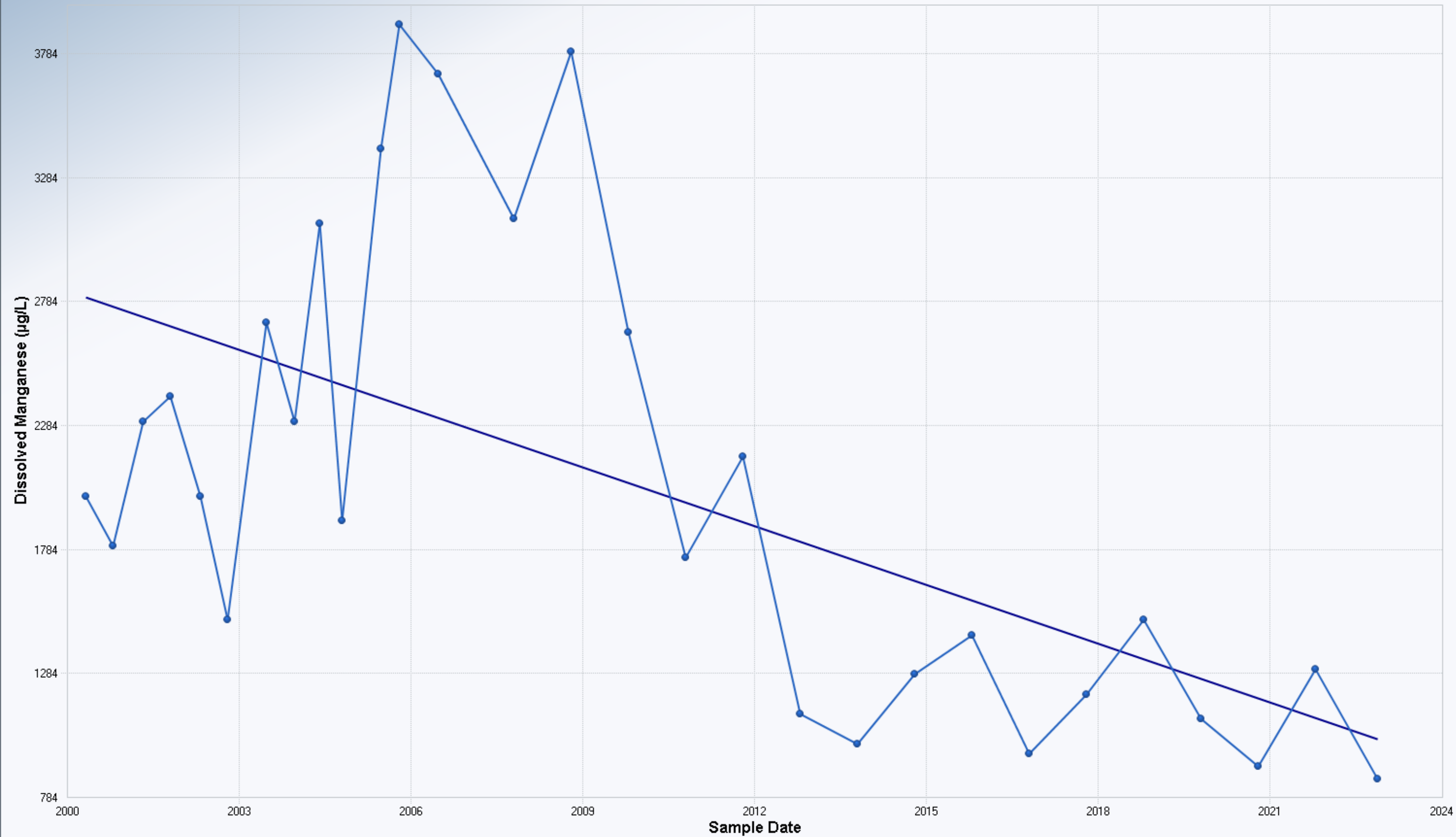


Mann-Kendall Trend Analysis	
n	29
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	53.3104
Standardized Value of S	-0.6565
M-K Test Value (S)	-36
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.2557

OLS Regression Line (Blue)	
OLS Regression Slope	-18.1019
OLS Regression Intercept	37,368.8991

Insufficient statistical evidence of a significant trend at the specified level of significance.

Mann-Kendall Trend Test for ZWM-99-22X - Dissolved Manganese



Mann-Kendall Trend Analysis

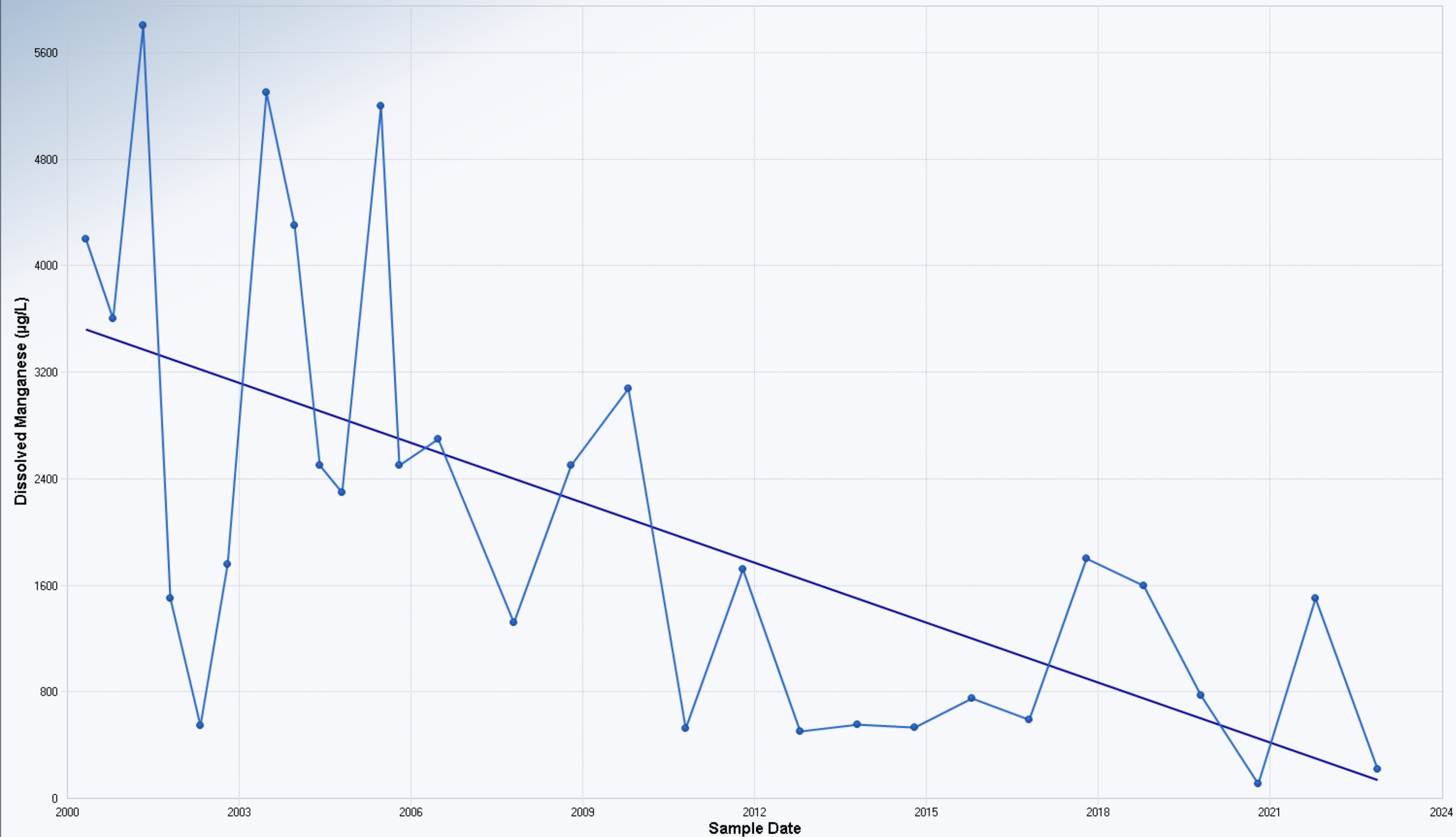
n	29
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	53.2823
Standardized Value of S	-3.0779
M-K Test Value (S)	-165
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0010

OLS Regression Line (Blue)

OLS Regression Slope	-79.0748
OLS Regression Intercept	160,976.2239

Statistically significant evidence of a decreasing trend at the specified level of significance.

Mann-Kendall Trend Test for ZWM-99-23X - Dissolved Manganese



Mann-Kendall Trend Analysis

n	29
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	53.2666
Standardized Value of S	-3.3980
M-K Test Value (S)	-182
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0003

OLS Regression Line (Blue)

OLS Regression Slope	-150.0149
OLS Regression Intercept	303,601.5854

Statistically significant evidence of a decreasing trend at the specified level of significance.

AOC 43G

AOC 43G
Total Manganese

Mann-Kendall Trend Test for AAFES-2 - Total Manganese

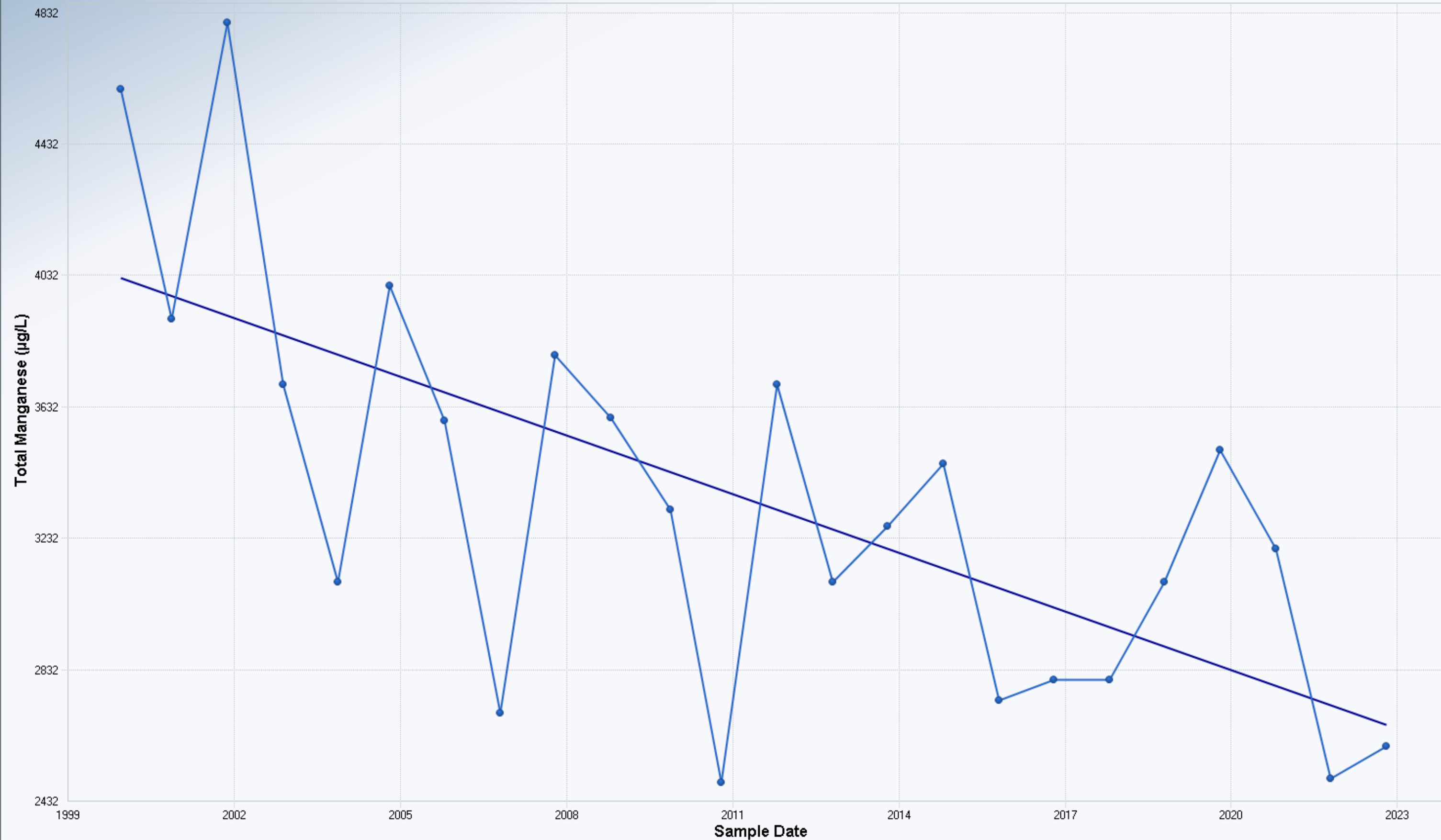
Mann-Kendall Trend Analysis

n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.2451
Standardized Value of S	-3.3296
M-K Test Value (S)	-135
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0004

OLS Regression Line (Blue)

OLS Regression Slope	-59.5454
OLS Regression Intercept	123,113.3935

Statistically significant evidence of a decreasing trend at the specified level of significance.



Mann-Kendall Trend Test for AAFES-7 - Total Manganese



Mann-Kendall Trend Analysis

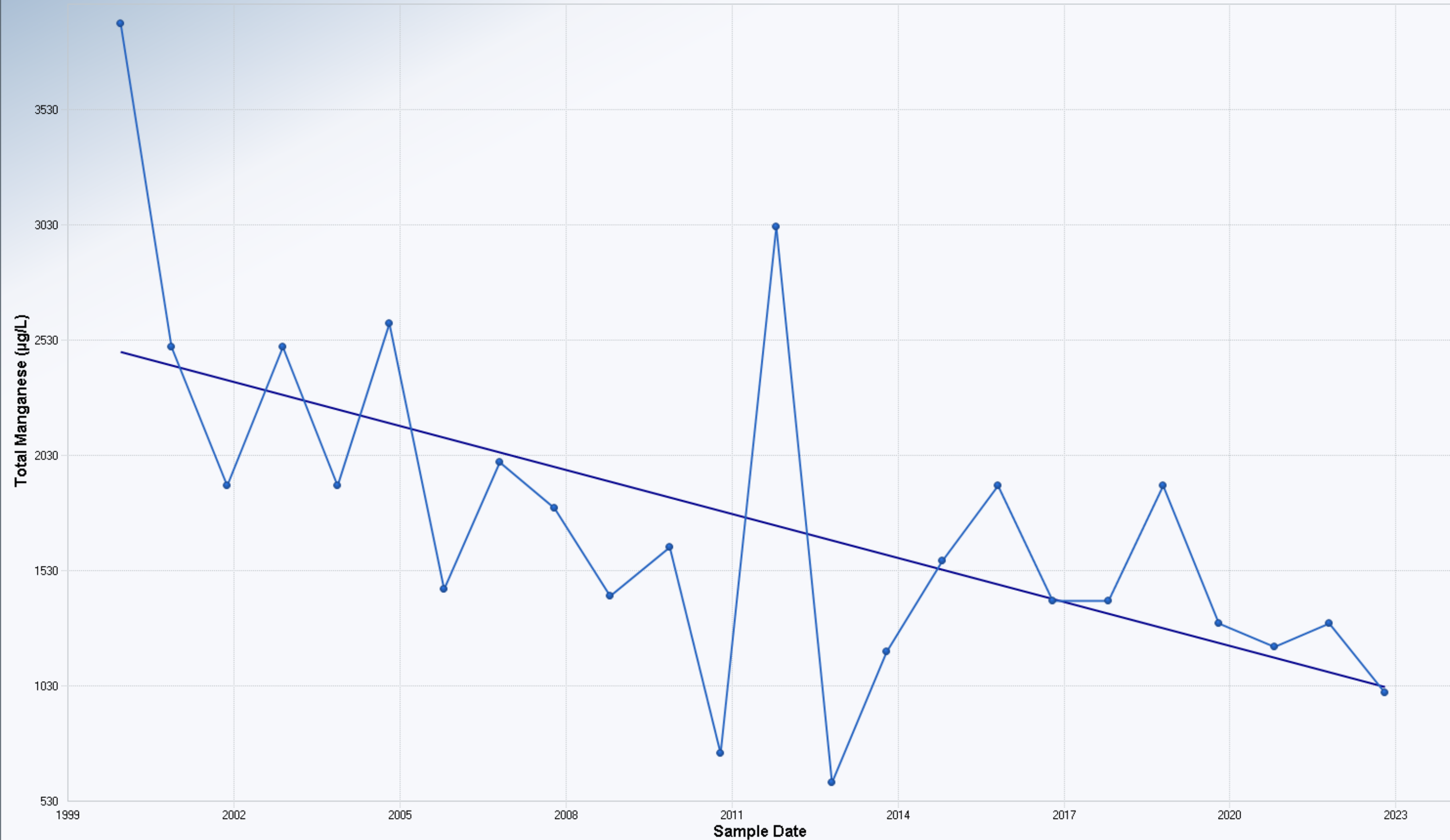
n	15
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	20.2073
Standardized Value of S	0.0990
M-K Test Value (S)	3
Tabulated p-value	0.4610
Approximate p-value	0.4606

OLS Regression Line (Blue)

OLS Regression Slope	34.1467
OLS Regression Intercept	-68,195.8299

Insufficient statistical evidence of a significant trend at the specified level of significance.

Mann-Kendall Trend Test for XGM-93-02X - Total Manganese



Mann-Kendall Trend Analysis

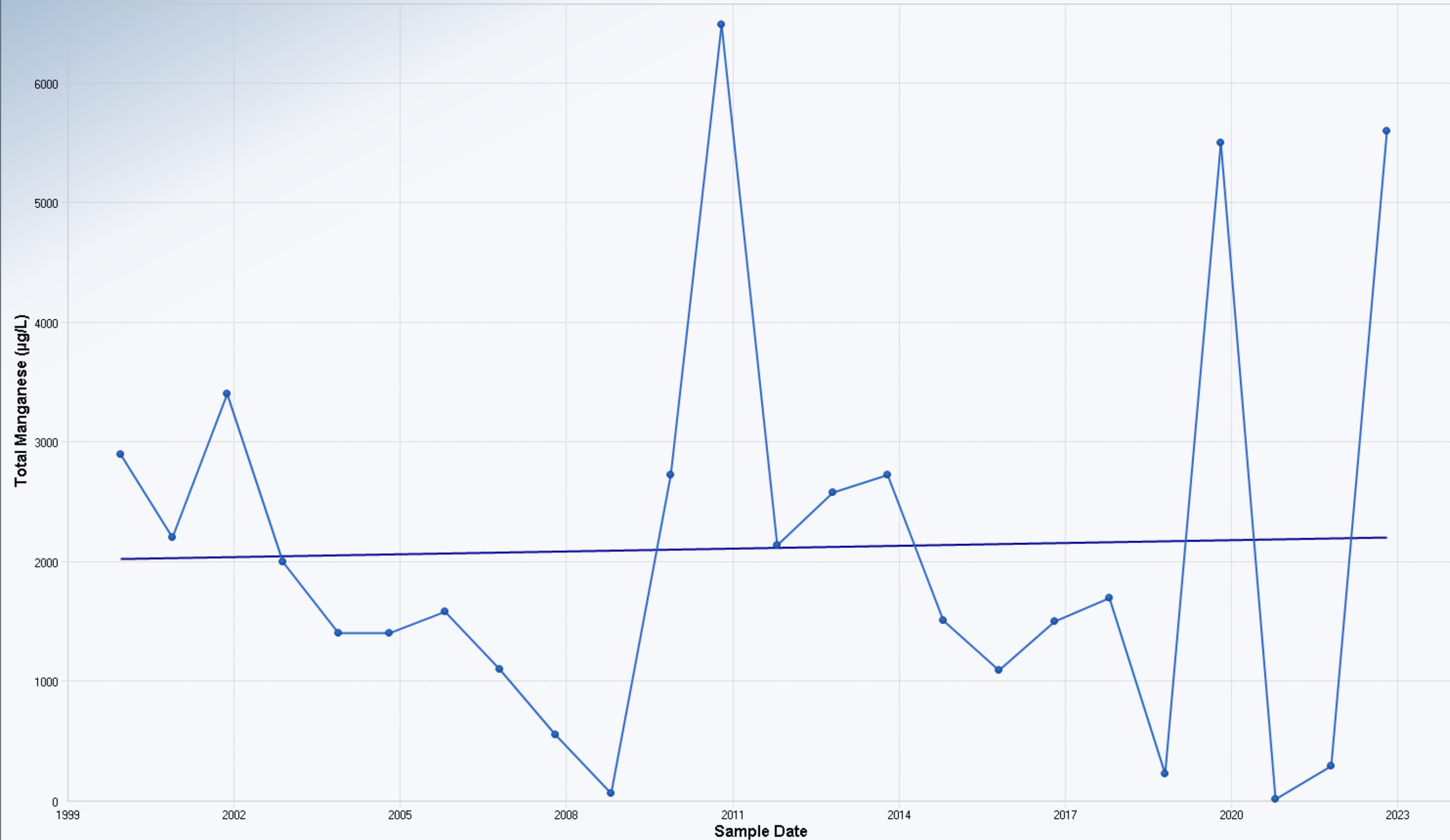
n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.1705
Standardized Value of S	-3.3856
M-K Test Value (S)	-137
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0004

OLS Regression Line (Blue)

OLS Regression Slope	-63.6988
OLS Regression Intercept	129,873.8840

Statistically significant evidence of a decreasing trend at the specified level of significance.

Mann-Kendall Trend Test for XGM-94-04X - Total Manganese



Mann-Kendall Trend Analysis

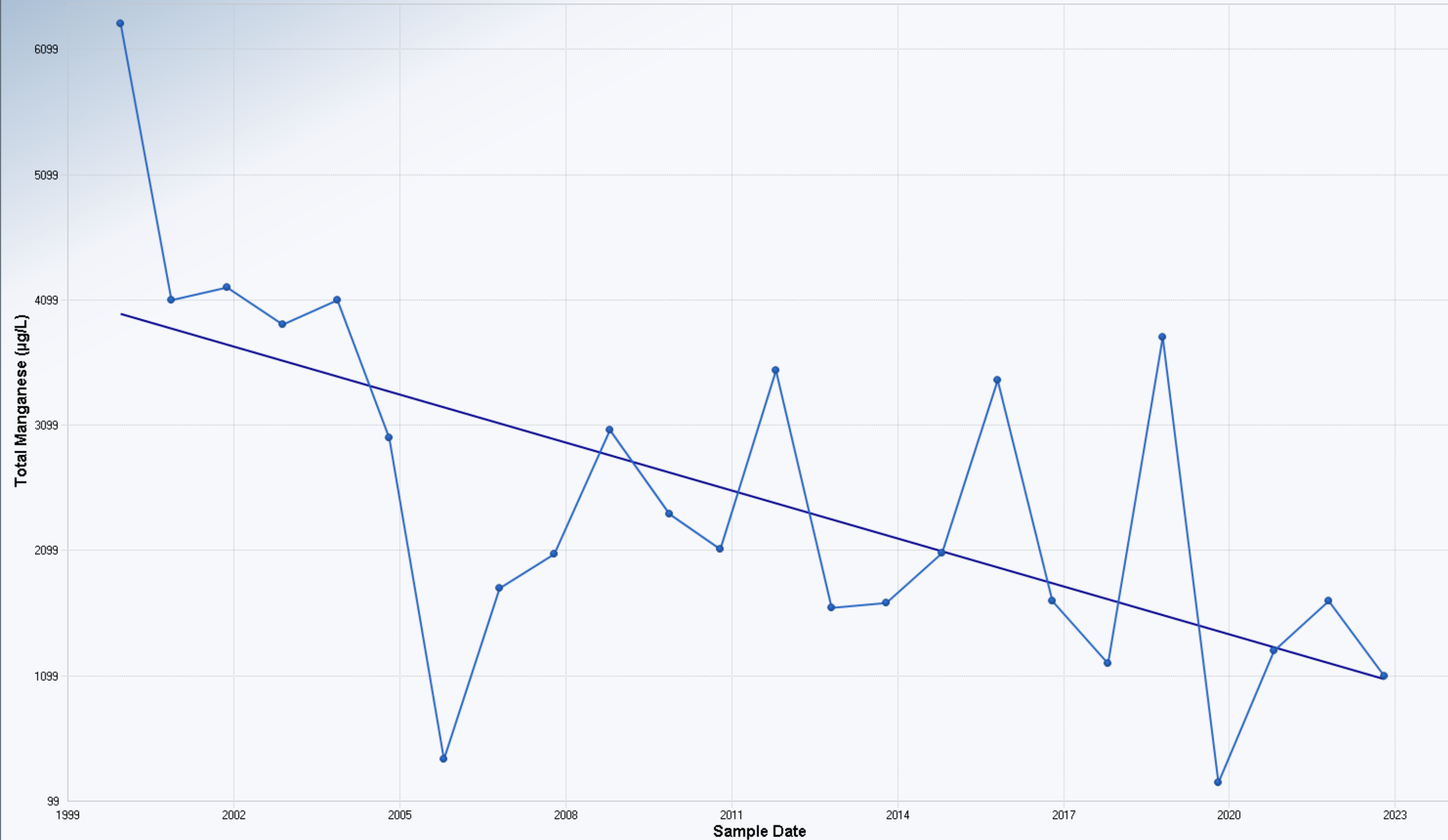
n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.2906
Standardized Value of S	-1.0176
M-K Test Value (S)	-42
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1544

OLS Regression Line (Blue)

OLS Regression Slope	7.9459
OLS Regression Intercept	-13,868.7589

Insufficient statistical evidence of a significant trend at the specified level of significance.

Mann-Kendall Trend Test for XGM-97-12X - Total Manganese



Mann-Kendall Trend Analysis

n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.2906
Standardized Value of S	-3.3507
M-K Test Value (S)	-136
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0004

OLS Regression Line (Blue)

OLS Regression Slope	-127.8992
OLS Regression Intercept	259,784.8274

Statistically significant evidence of a decreasing trend at the specified level of significance.

AOC 43G
Total Iron

Mann-Kendall Trend Test for AAFES-2 - Total Iron



Mann-Kendall Trend Analysis

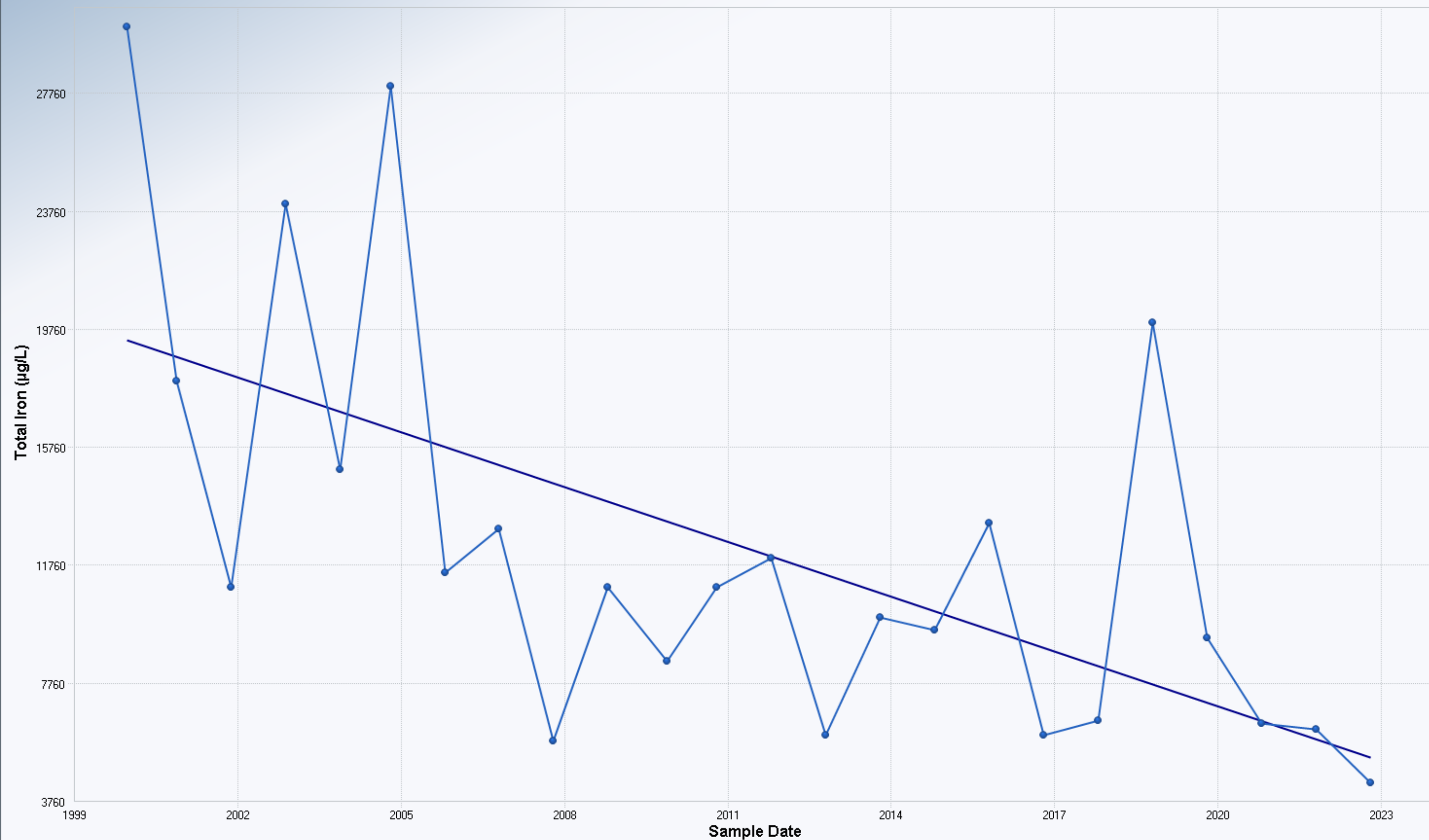
n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.1248
Standardized Value of S	-2.4673
M-K Test Value (S)	-100
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0068

OLS Regression Line (Blue)

OLS Regression Slope	-315.5041
OLS Regression Intercept	652,651.5578

Statistically significant evidence of a decreasing trend at the specified level of significance.

Mann-Kendall Trend Test for XGM-93-02X - Total Iron



Mann-Kendall Trend Analysis

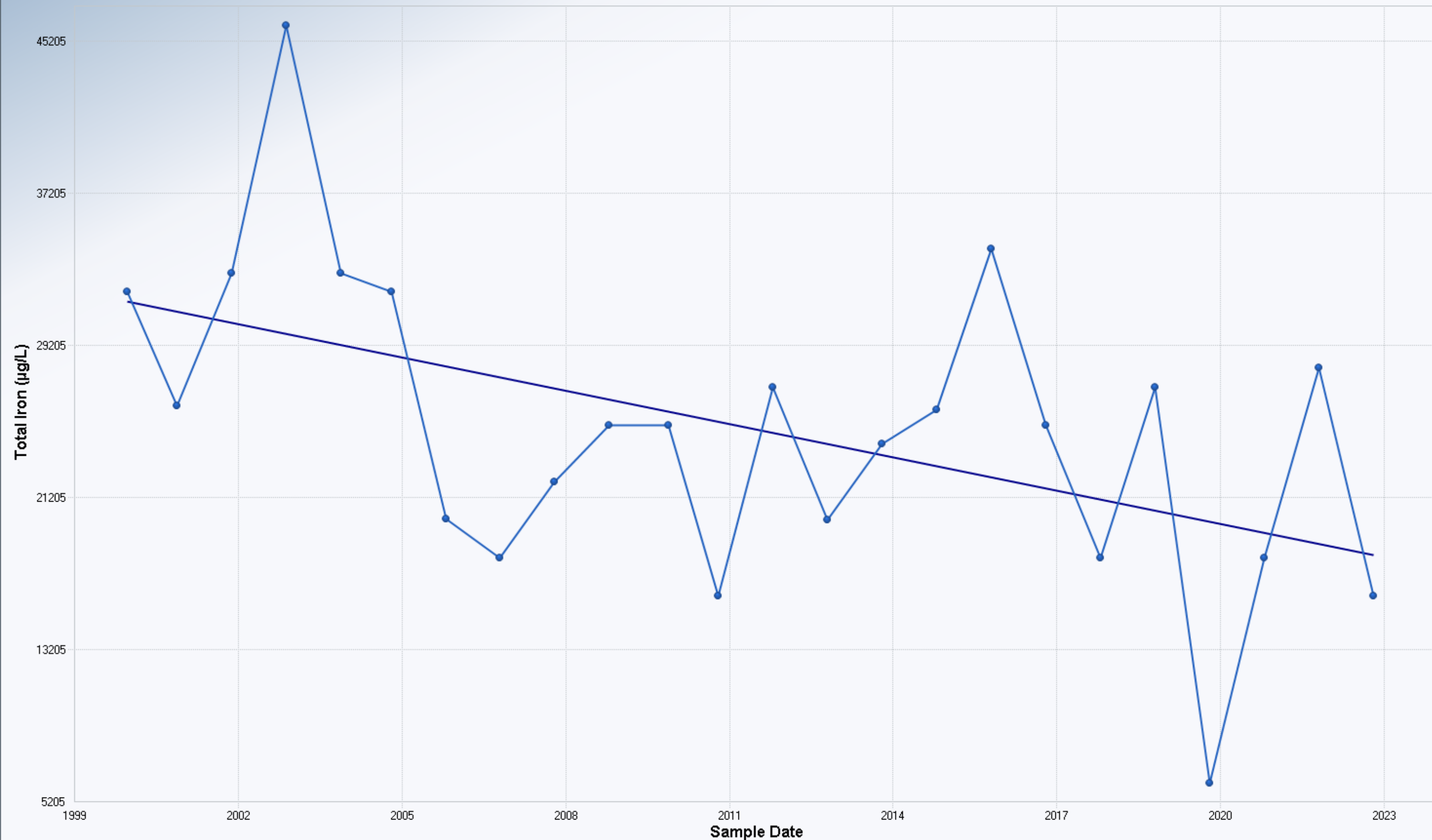
n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.2575
Standardized Value of S	-3.3037
M-K Test Value (S)	-134
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0005

OLS Regression Line (Blue)

OLS Regression Slope	-620.0347
OLS Regression Intercept	1,259,439.3417

Statistically significant evidence of a decreasing trend at the specified level of significance.

Mann-Kendall Trend Test for XGM-97-12X - Total Iron



Mann-Kendall Trend Analysis	
n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.1746
Standardized Value of S	-2.0660
M-K Test Value (S)	-84
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0194

OLS Regression Line (Blue)	
OLS Regression Slope	-584.4441
OLS Regression Intercept	1,200,397.7397

Statistically significant evidence of a decreasing trend at the specified level of significance.

AOC 43G
VPH C₅-C₈

Mann-Kendall Trend Test for AAFES-2 - VPH C5-C8 Aliphatics

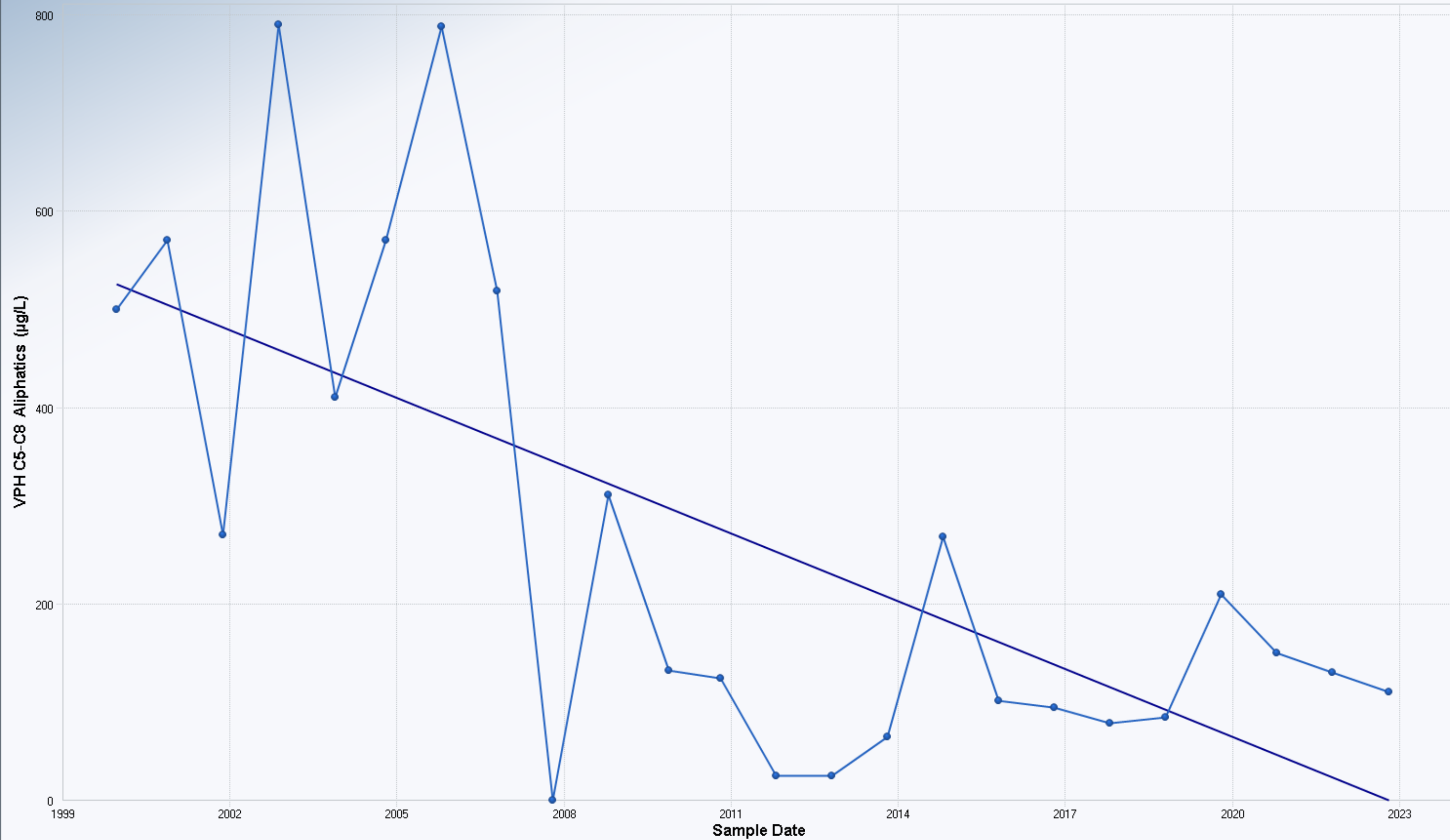


Mann-Kendall Trend Analysis	
n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.2451
Standardized Value of S	-1.8387
M-K Test Value (S)	-75
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0330

OLS Regression Line (Blue)	
OLS Regression Slope	-18.0366
OLS Regression Intercept	37,290.1633

Statistically significant evidence of a decreasing trend at the specified level of significance.

Mann-Kendall Trend Test for XGM-93-02X - VPH C5-C8 Aliphatics



Mann-Kendall Trend Analysis

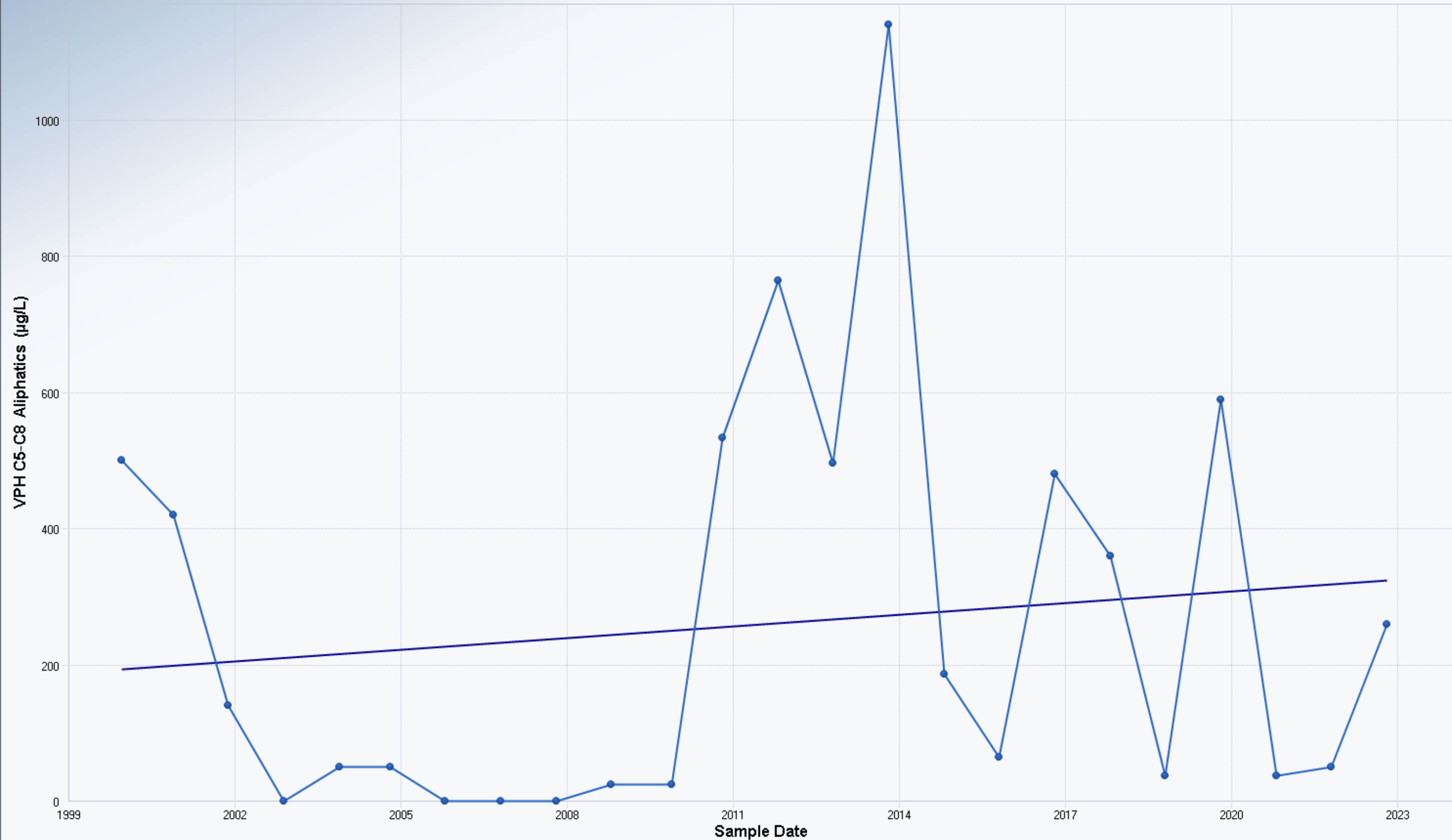
n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.2906
Standardized Value of S	-2.5564
M-K Test Value (S)	-104
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0053

OLS Regression Line (Blue)

OLS Regression Slope	-23.0543
OLS Regression Intercept	46,633.2237

Statistically significant evidence of a decreasing trend at the specified level of significance.

Mann-Kendall Trend Test for XGM-94-04X -VPH C5-C8 Aliphatics



Mann-Kendall Trend Analysis

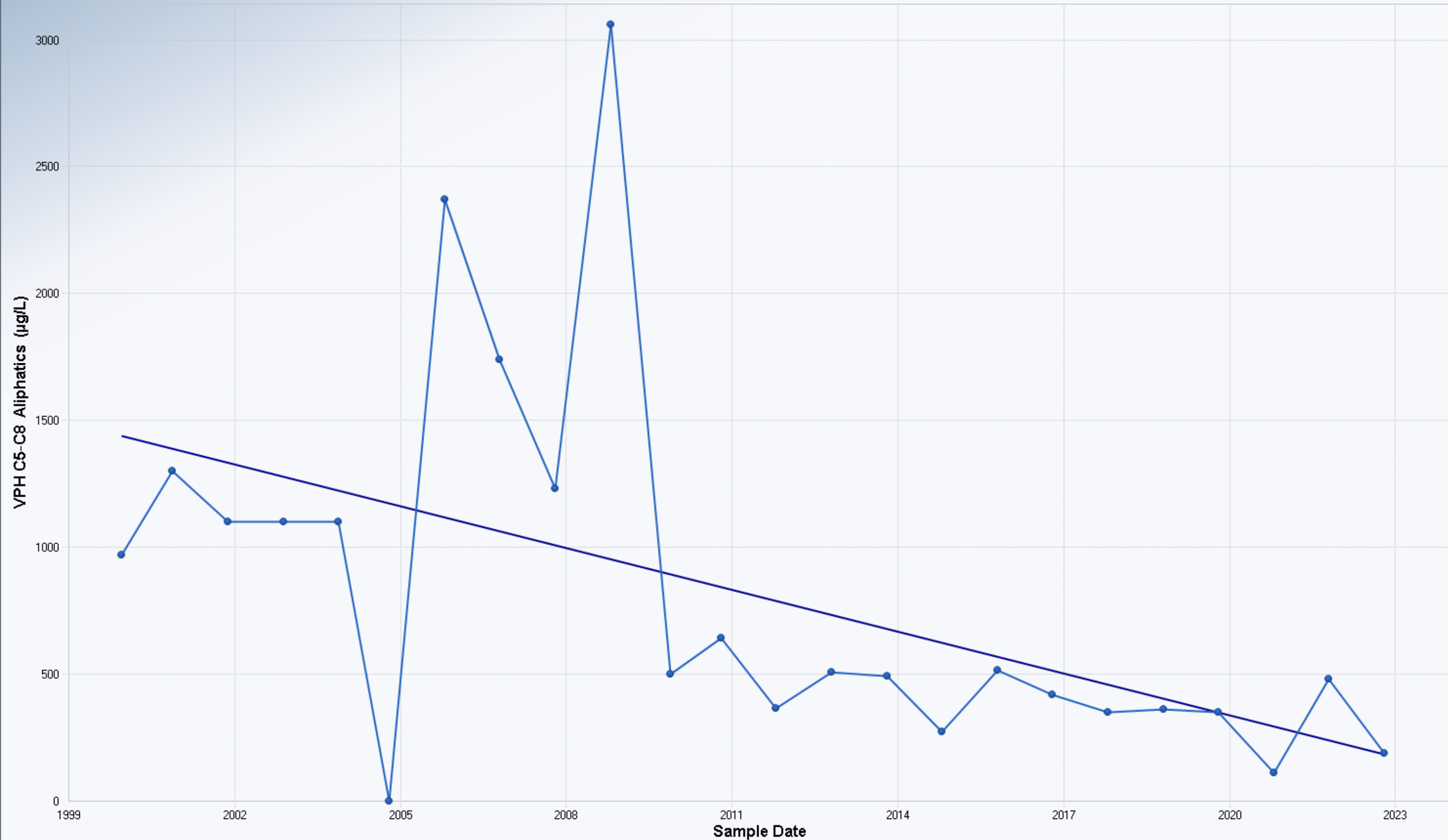
n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.1373
Standardized Value of S	0.7973
M-K Test Value (S)	33
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.2126

OLS Regression Line (Blue)

OLS Regression Slope	5.6985
OLS Regression Intercept	-11,202.7509

Insufficient statistical evidence of a significant trend at the specified level of significance.

Mann-Kendall Trend Test for XGM-97-12X - VPH C5-C8 Aliphatics



Mann-Kendall Trend Analysis

n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.2575
Standardized Value of S	-3.4031
M-K Test Value (S)	-138
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0003

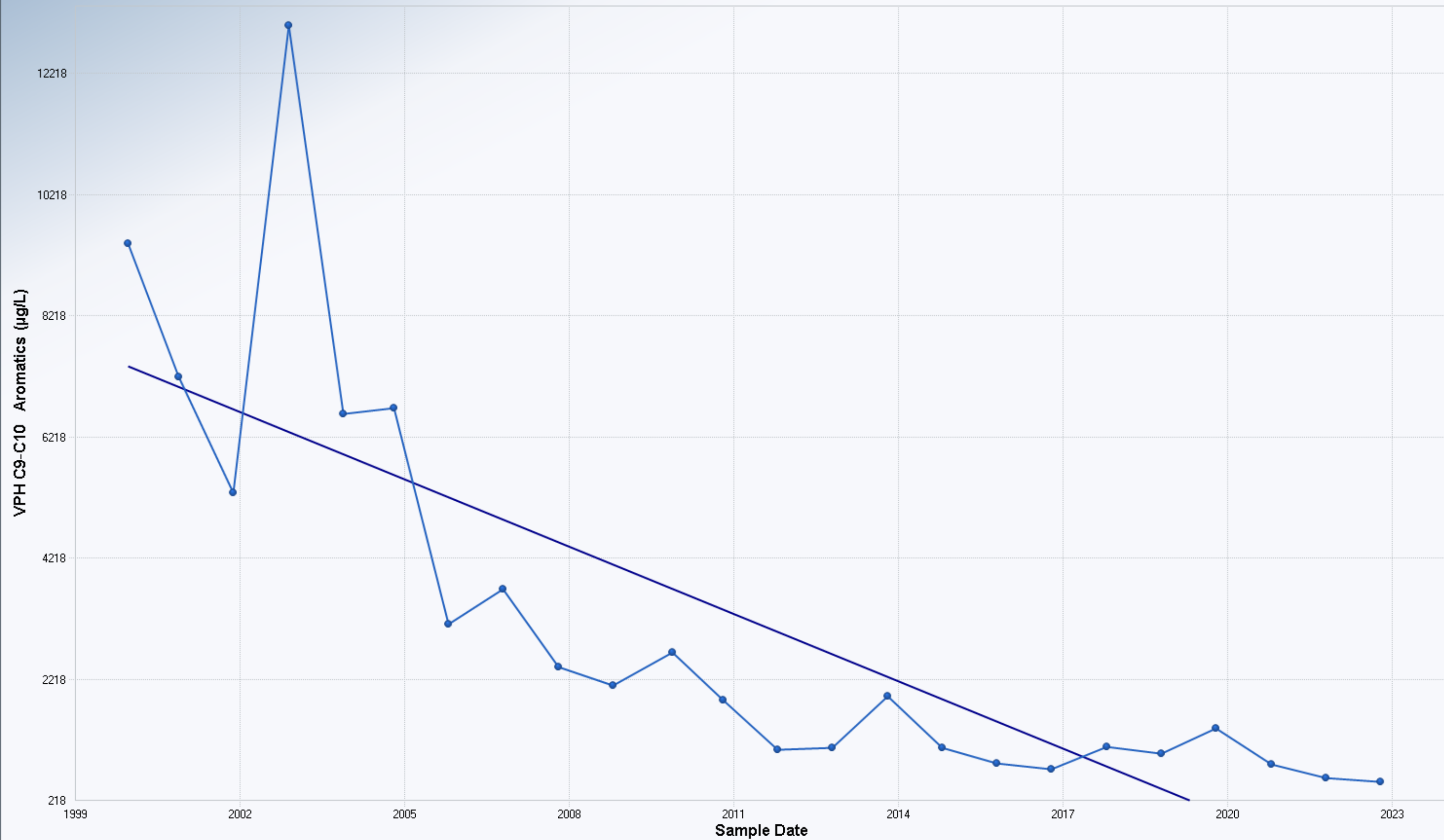
OLS Regression Line (Blue)

OLS Regression Slope	-54.9482
OLS Regression Intercept	111,332.3020

Statistically significant evidence of a decreasing trend at the specified level of significance.

AOC 43G
VPH C₉-C₁₀

Mann-Kendall Trend Test for AAFES-2 - VPH C9-C10 Aromatics



Mann-Kendall Trend Analysis

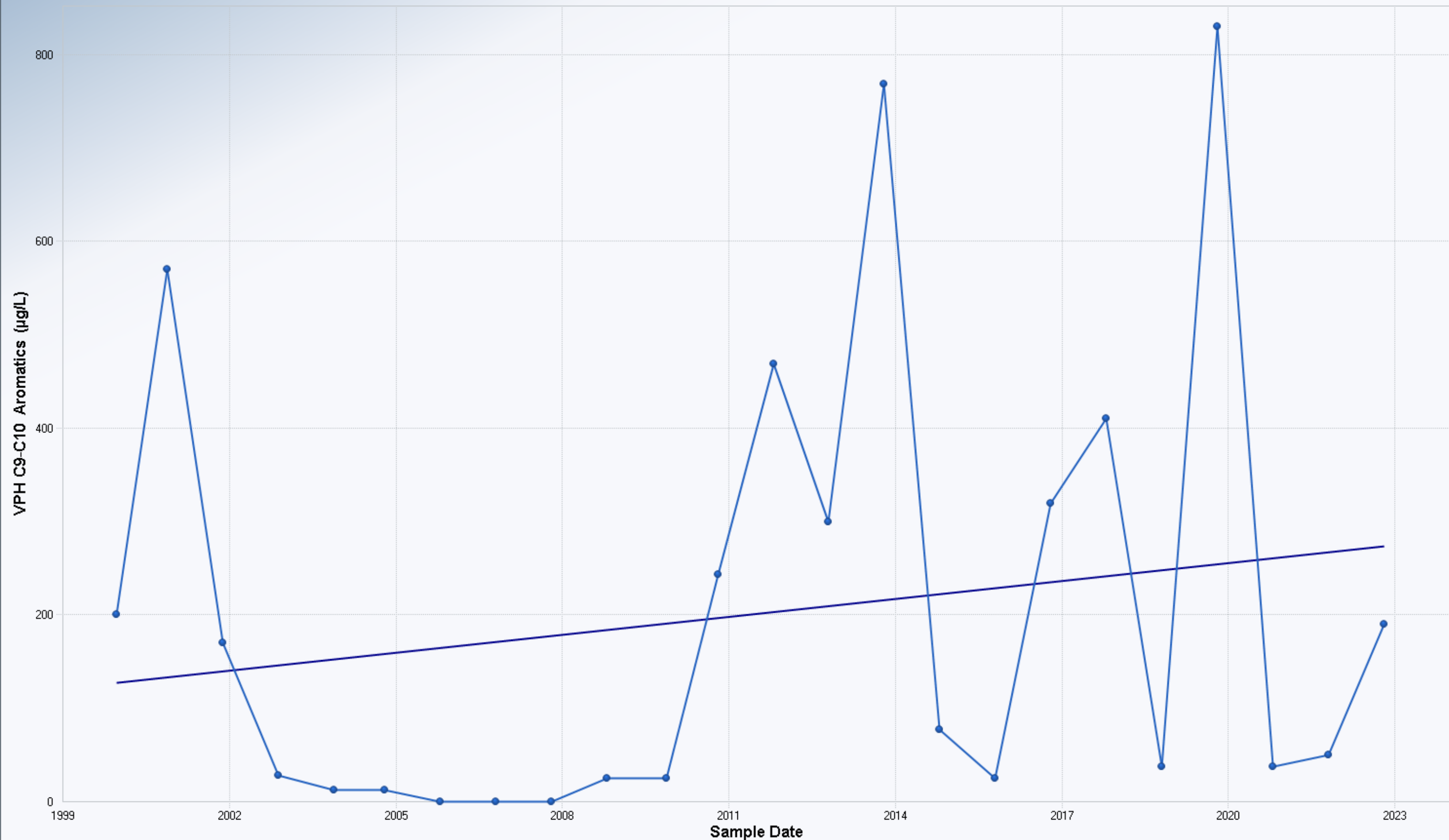
n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.3030
Standardized Value of S	-5.3594
M-K Test Value (S)	-217
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-370.6604
OLS Regression Intercept	748,695.3850

Statistically significant evidence of a decreasing trend at the specified level of significance.

Mann-Kendall Trend Test for XGM-94-04X - VPH C9-C10 Aromatics

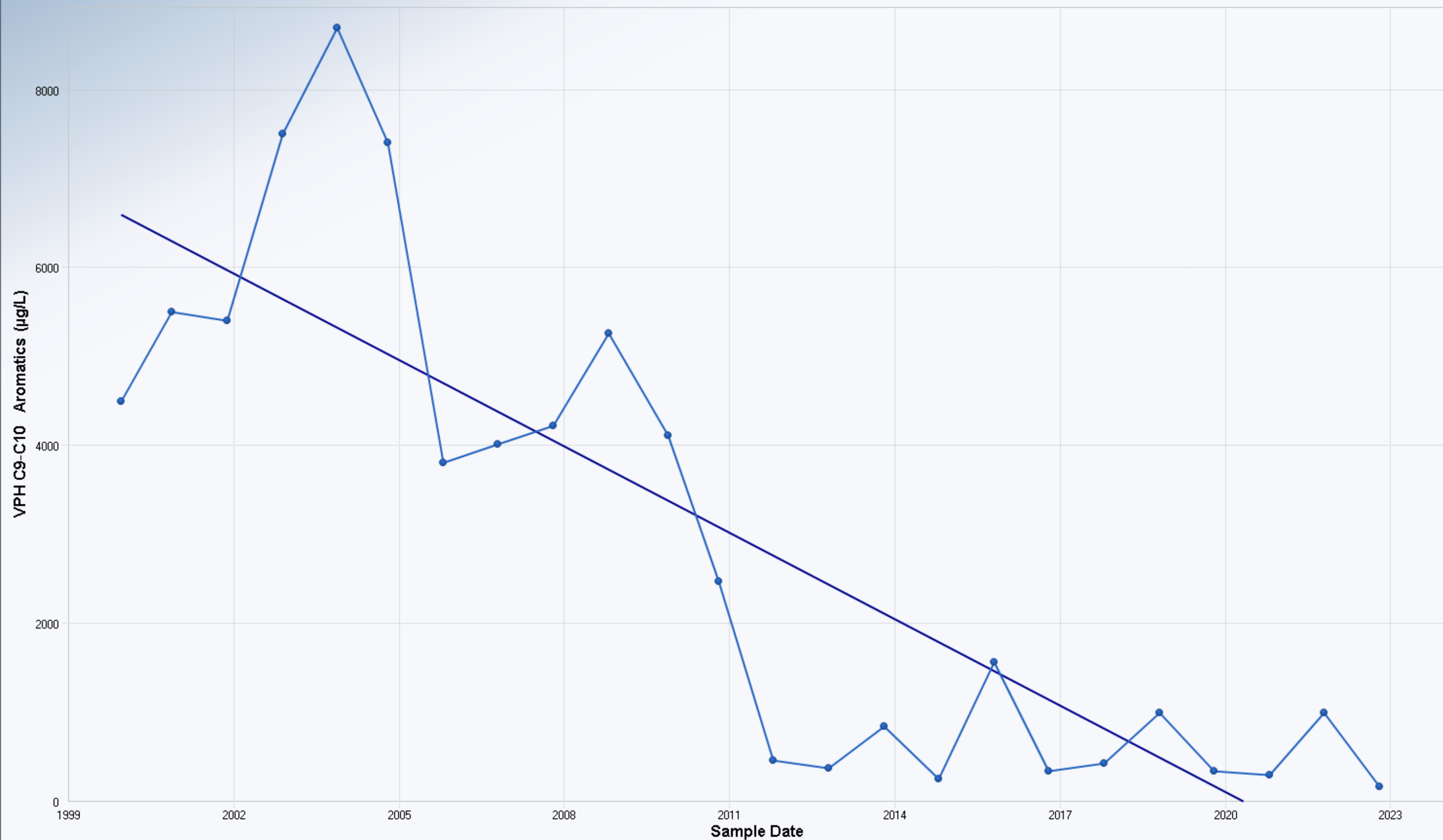


Mann-Kendall Trend Analysis	
n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.1995
Standardized Value of S	1.3682
M-K Test Value (S)	56
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0856

OLS Regression Line (Blue)
OLS Regression Slope: 6.3714
OLS Regression Intercept: -12,614.9170

Insufficient statistical evidence of a significant trend at the specified level of significance.

Mann-Kendall Trend Test for XGM-97-12X - VPH C9-C10 Aromatics



Mann-Kendall Trend Analysis

n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.2906
Standardized Value of S	-4.4427
M-K Test Value (S)	-180
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

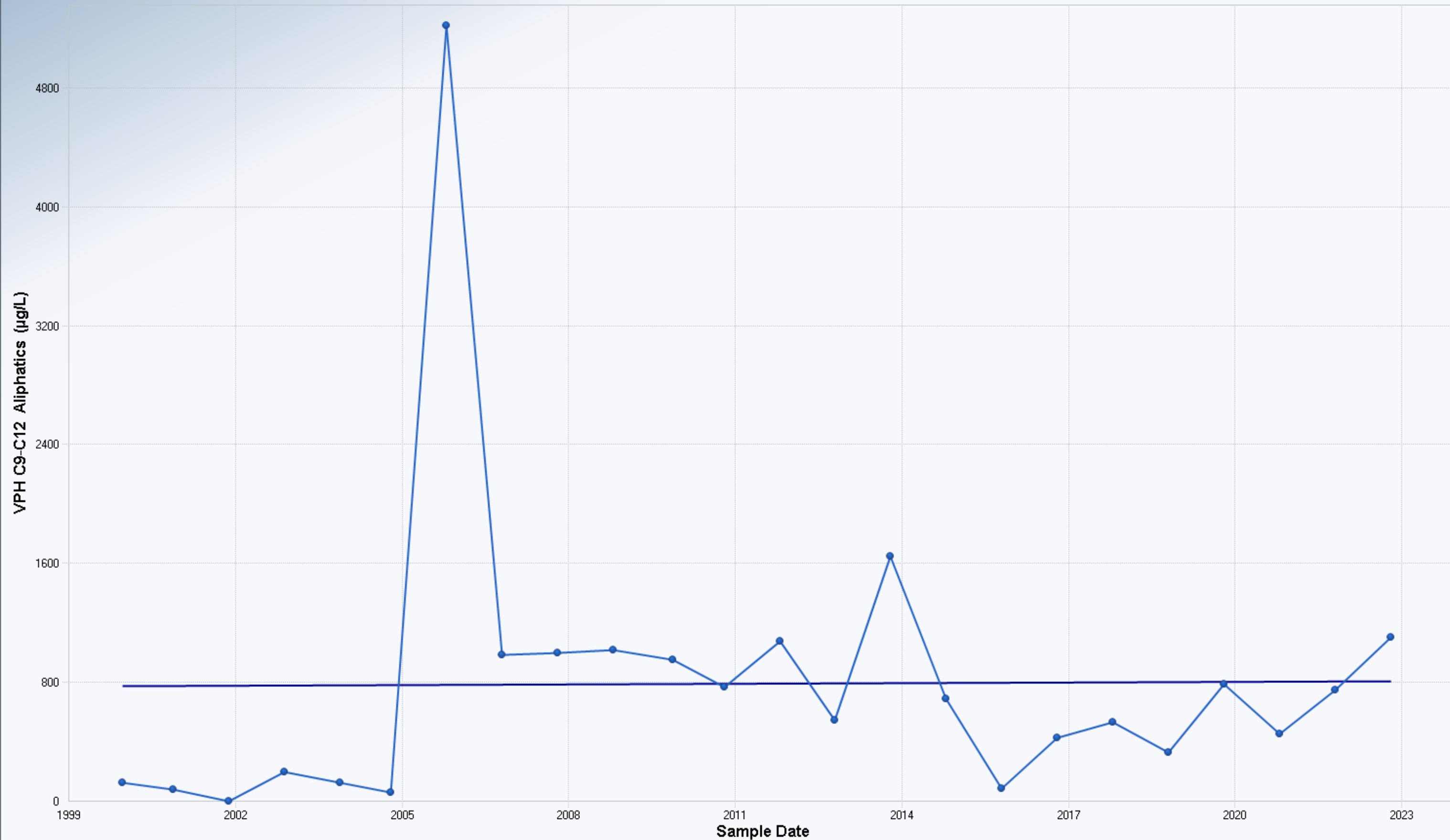
OLS Regression Line (Blue)

OLS Regression Slope	-324.1091
OLS Regression Intercept	654,801.9777

Statistically significant evidence of a decreasing trend at the specified level of significance.

AOC 43G
VPH C₉-C₁₂

Mann-Kendall Trend Test for AAFES-2 - VPH C9-C12 Aliphatics



Mann-Kendall Trend Analysis

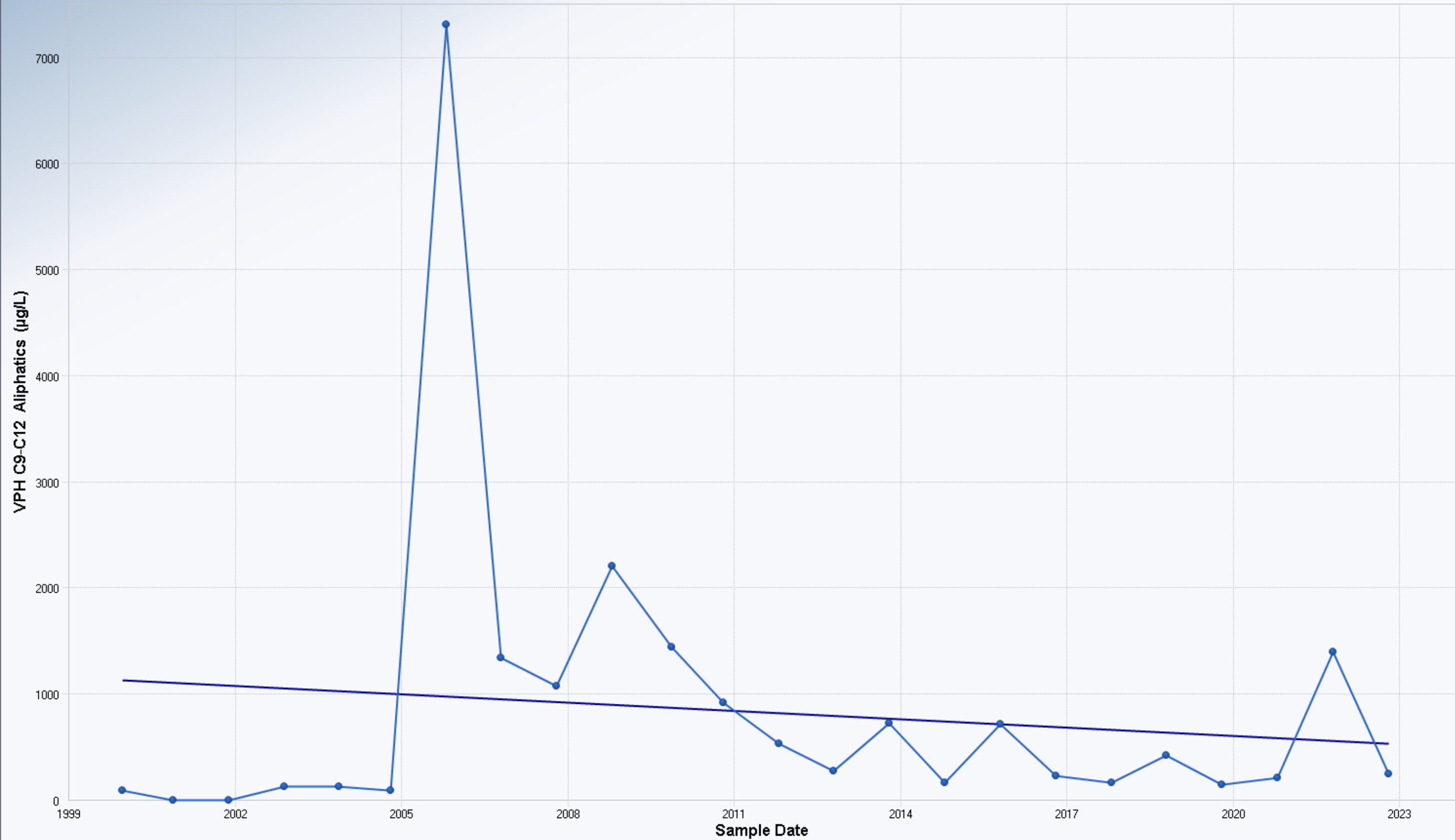
n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.3030
Standardized Value of S	1.2406
M-K Test Value (S)	51
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.1074

OLS Regression Line (Blue)

OLS Regression Slope	1.2726
OLS Regression Intercept	-1,769.7214

Insufficient statistical evidence of a significant trend at the specified level of significance.

Mann-Kendall Trend Test for XGM-97-12X - VPH C9-C12 Aliphatics



Mann-Kendall Trend Analysis

n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.3030
Standardized Value of S	0.6947
M-K Test Value (S)	29
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.2436

OLS Regression Line (Blue)

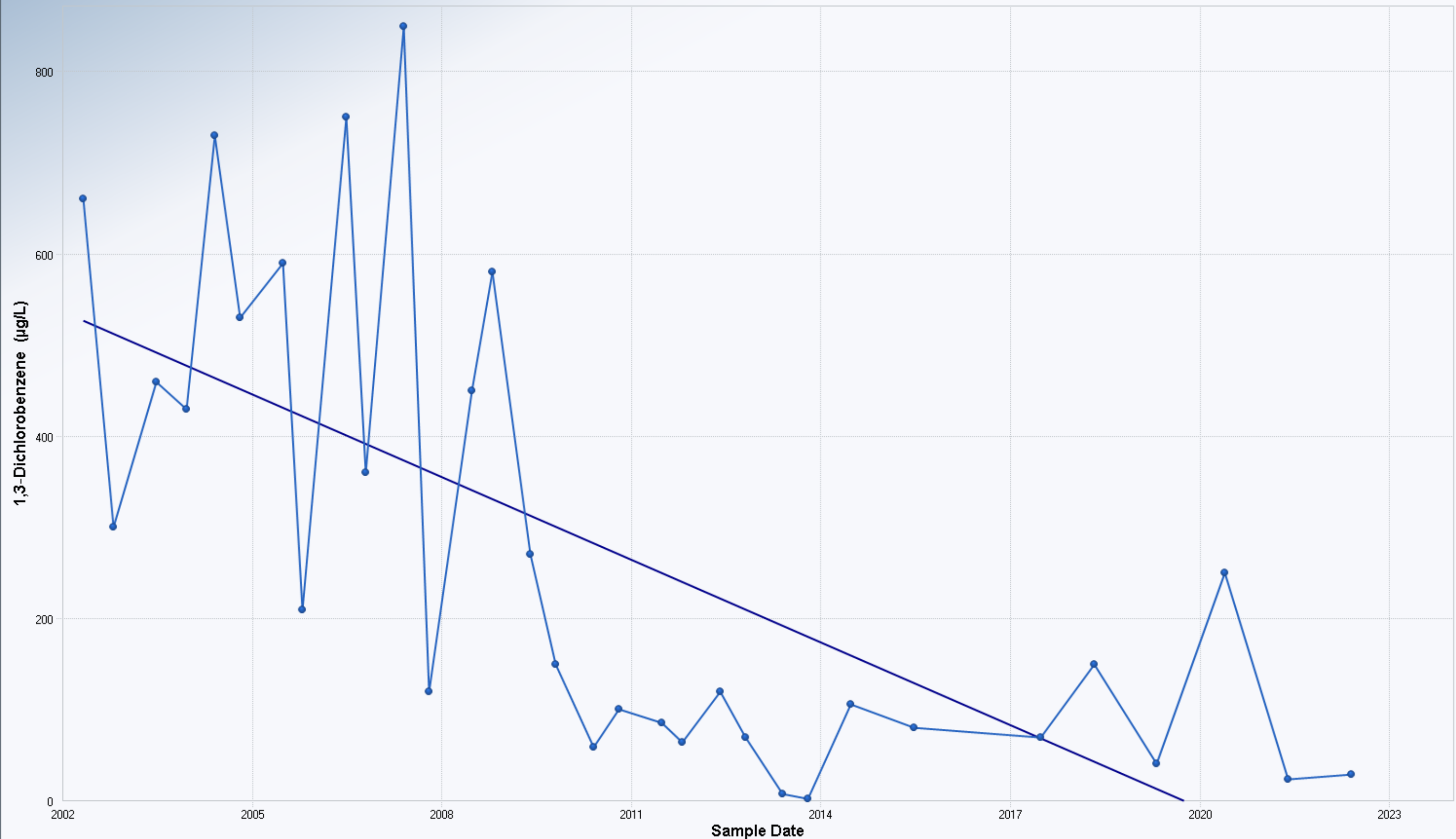
OLS Regression Slope	-25.9171
OLS Regression Intercept	52,960.3921

Insufficient statistical evidence of a significant trend at the specified level of significance.

AOCs 32 & 43A

AOC 32 & 43A
1,3-Dichlorobenzene

Mann-Kendall Trend Test for 32M-01-18XBR - 1,3-Dichlorobenzene



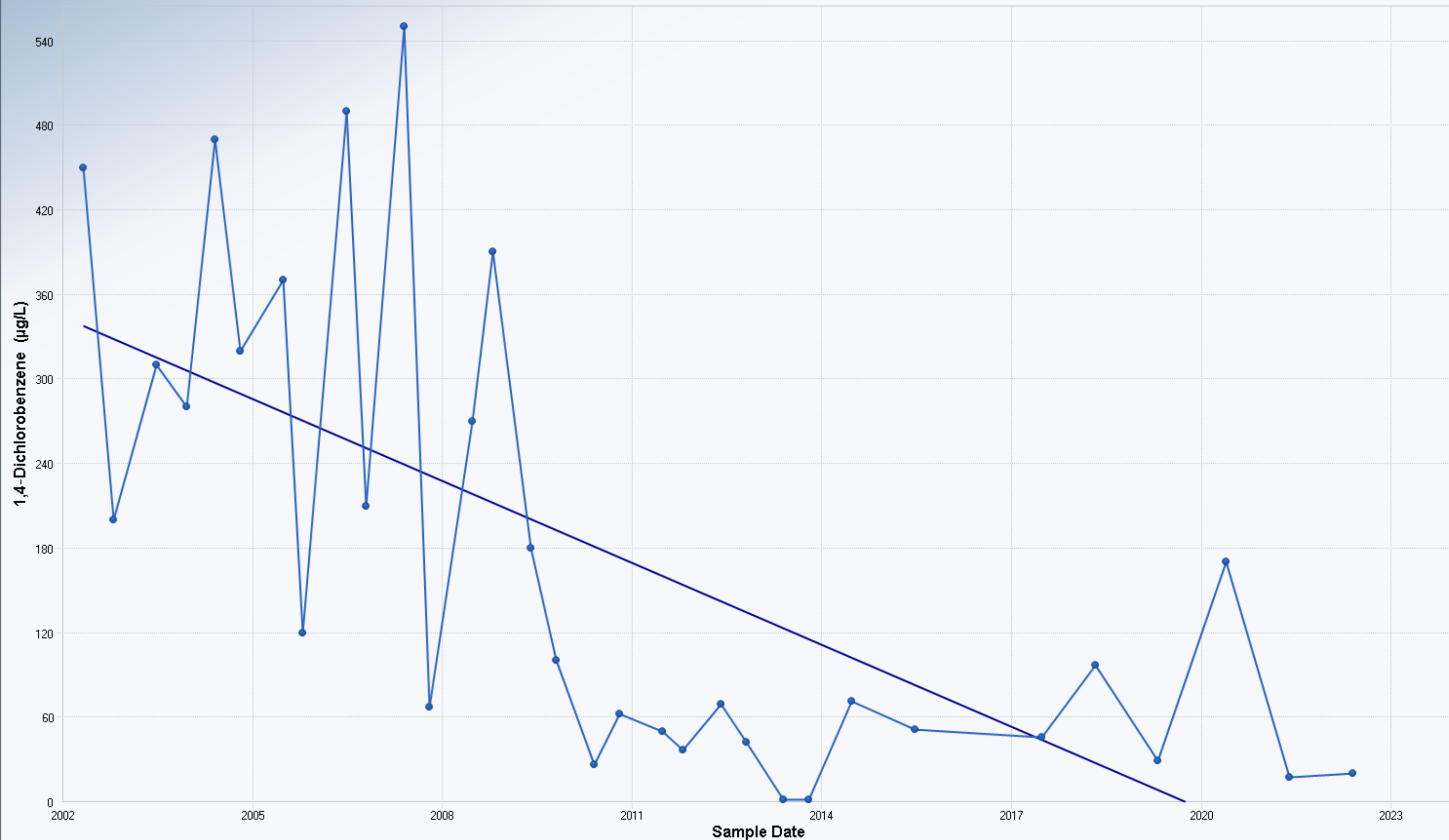
Mann-Kendall Trend Analysis	
n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6414
Standardized Value of S	-4.4451
M-K Test Value (S)	-275
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)	
OLS Regression Slope	-30.2765
OLS Regression Intercept	61,150.3809

Statistically significant evidence of a decreasing trend at the specified level of significance.

AOC 32 & 43A
1,4-Dichlorobenzene

Mann-Kendall Trend Test for 32M-01-18XBR - 1,4-Dichlorobenzene



Mann-Kendall Trend Analysis	
n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6658
Standardized Value of S	-4.2974
M-K Test Value (S)	-266
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)	
OLS Regression Slope	-19.4212
OLS Regression Intercept	39,225.3166

Statistically significant evidence of a decreasing trend at the specified level of significance.

AOC 32 & 43A
Chlorobenzene

Mann-Kendall Trend Test for 32M-01-18XBR - Chlorobenzene



Mann-Kendall Trend Analysis

n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.3030
Standardized Value of S	-1.5383
M-K Test Value (S)	-63
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0620

OLS Regression Line (Blue)

OLS Regression Slope	-28.6394
OLS Regression Intercept	58,024.8056

Insufficient statistical evidence of a significant trend at the specified level of significance.

AOC 32 & 43A
VPH C₉-C₁₀

Mann-Kendall Trend Test for 32M-01-18XBR - VPH C9-C10 Aromatics



Mann-Kendall Trend Analysis	
n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6577
Standardized Value of S	-4.1520
M-K Test Value (S)	-257
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)	
OLS Regression Slope	-283.3401
OLS Regression Intercept	571,794.0154

Statistically significant evidence of a decreasing trend at the specified level of significance.

AOC 32 & 43A
Total Arsenic

Mann-Kendall Trend Test for 32M-01-14XOB - Total Arsenic



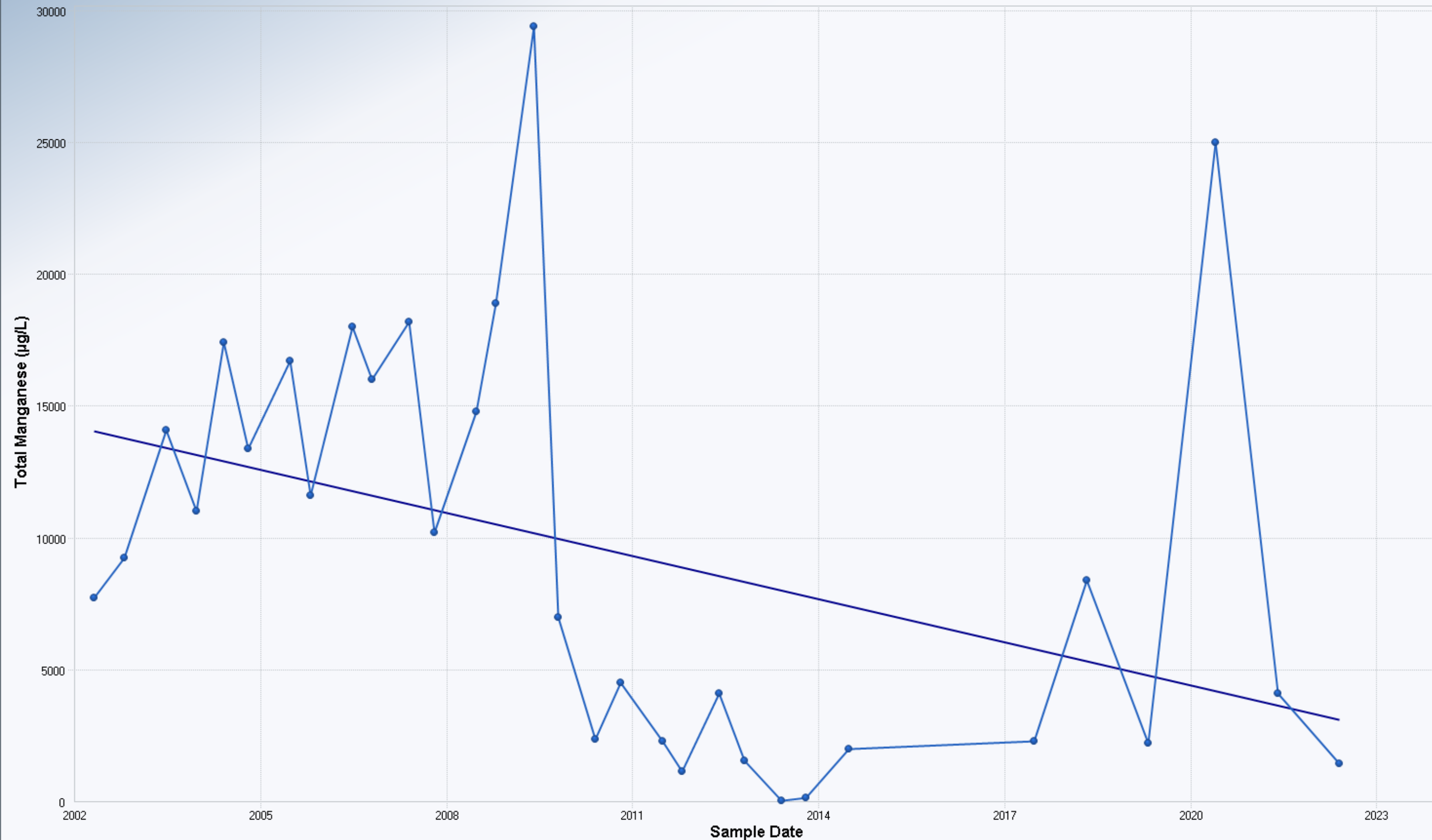
Mann-Kendall Trend Analysis	
n	20
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	30.7896
Standardized Value of S	-1.8513
M-K Test Value (S)	-58
Tabulated p-value	0.0320
Approximate p-value	0.0321

OLS Regression Line (Blue)	
OLS Regression Slope	-1.7265
OLS Regression Intercept	3,527.4810

Statistically significant evidence of a decreasing trend at the specified level of significance.

AOC 32 & 43A
Total Manganese

Mann-Kendall Trend Test for 32M-01-18XBR - Total Manganese



Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.8189
Standardized Value of S	-2.7202
M-K Test Value (S)	-161
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0033

OLS Regression Line (Blue)

OLS Regression Slope	-545.2860
OLS Regression Intercept	1,105,876.8478

Statistically significant evidence of a decreasing trend at the specified level of significance.

Appendix F

Annual Land Use Control Documentation

Annual Land Use Control Plan Checklist for AOC 32 and 43A

This checklist has been developed from the USEPA guidance document Comprehensive Five Year Review Guidance dated June 2001 (OSWER No. 9355.7-03B-P) and from Section 4.0 of the 2015 Draft Long-Term Monitoring Plan, Devens, Massachusetts. The Checklist was modified to site-specific conditions as recommended by the guidance document. The checklist will be completed annually and submitted with the Main Post annual long-term monitoring report. The checklist will also be used to assist in compiling information for the five-year review.

I. Site Information			
Site Name/Location: AOC 32/43A		Name/Affiliation: Ian Martz / Arcadis	
Remedy Includes: Long Term Monitoring, Institutional Controls			
Inspection Date: December 7, 2022			
Participants: Grace Sheckler (Arcadis), Brent Smith (USACE)			
II. Documentation and Records			
Item	Yes	No	Comments
Any related notices filed with Devens Enterprise Commission?		X	
Any related Department of Public Works permits found?		X	
Any related zoning permits or variances found?		X	
Any related Conservation Commission findings, proposals, or notices of intent found?		X	
III. Physical On-Site Inspection			
Item	Yes	No	Comments
Any evidence of new construction or excavation present in the area of the remedy?	X		The on-site facility manager (Rich Smith) and risk manager (Jason Grasham) from O'Reilly pointed out several pavement cut-outs in the paved parking/roadway area to the east of the O'Reilly building. SA-JV and USACE personnel were unaware of the cut-outs and did not know why they were present. The SA-JV followed up with O'Reilly regarding the origin of the cut-outs and received a response from O'Reilly via email on February 20, 2023, that the cut-outs were from ground sampling done after a leak from a vehicle. The SA-JV determined that the pavement cutouts were artifacts from soil sampling and limited soil excavation work conducted under MassDEP RTN 2-21677. This RTN was opened in August 2021 due to a spill of up to 150 gallons of diesel fuel from an O'Reilly truck. The RTN was closed with a Permanent Solution Statement in October 2021 by Omni Environmental Group. O'Reilly has scheduled repairs to the pavement area in spring 2023.
Any damage to on-site monitoring wells?	X		Installed new flushmount roadbox at one well (32Z-01-09XOB) on May 18, 2022. Some other roadboxes were observed to have cracked concrete; these locations will be monitored if/when future repairs are needed.
Is there evidence of damage to the remedy?		X	
Any groundwater extraction wells present?		X	

Annual Land Use Control Plan Checklist for AOC 32 and 43A

This checklist has been developed from the USEPA guidance document Comprehensive Five Year Review Guidance dated June 2001 (OSWER No. 9355.7-03B-P) and from Section 4.0 of the 2015 Draft Long-Term Monitoring Plan, Devens, Massachusetts. The Checklist was modified to site-specific conditions as recommended by the guidance document. The checklist will be completed annually and submitted with the Main Post annual long-term monitoring report. The checklist will also be used to assist in compiling information for the five-year review.

Is there sufficient access to the site for monitoring?	X		
Any signs of increased exposure potential?		X	
IV. Interview #1			
Name of Interviewer: Ian Martz (Arcadis)			
Name of Interviewee: Neil Angus (Devens Enterprise Commission), Anne-Marie Dowd (MassDevelopment)			
Contact Information: neilangus@devensec.com, 978-772-8831 x3334; amdowd@massdevelopment.com, 857-345-2859			
Interview Notes: Emailed final 2021 LUC forms to the above contacts for review on 1/13/2023. Performed phone interview on 1/27/2023.			
Site Update: The Army is currently investigating PFAS which have been detected at the Former Fort Devens. A record-of-decision has not been completed for PFAS. O'Reilly Auto Parts Warehouse is located within the footprint of AOC 32/43A. They are required to submit an annual Stormwater Management O&M Report to Devens Enterprise Commission. The facility also has two monitoring wells which are sampled annually: APEX-MW-OB-1 and APEX-MW-BR-2. The identity of the O'Reilly wells have been included at the request of the USACE. The annual reports are submitted to MassDEP and Devens Enterprise Commission.			
Item	Yes	No	Comments
Is interviewee familiar with the land use controls imposed upon the property & documentation of these controls?	X		
Are there any extraction wells at the property?		X	
Are there any proposed plans for property sale, future development, construction or demolition activities at the property?		X	
Are there any issues with site access for monitoring?		X	
IV. Interview #2			
Name of Interviewer: Ian Martz / Arcadis			
Name of Interviewee: John Bounds - Environmental Health & Safety Manager - O'Reilly Auto Parts			
Contact information: jbounds2@oreillyauto.com, 417-520-4589			
Interview Notes: Sent email with interview questions to Mr. Bounds on 1/30/2023, received response on 2/13/2023; responses are recorded below.			
Item	Yes	No	Comments
Is interviewee familiar with the land use controls imposed upon the property & documentation of these controls?	X		

Annual Land Use Control Plan Checklist for AOC 32 and 43A

This checklist has been developed from the USEPA guidance document Comprehensive Five Year Review Guidance dated June 2001 (OSWER No. 9355.7-03B-P) and from Section 4.0 of the 2015 Draft Long-Term Monitoring Plan, Devens, Massachusetts. The Checklist was modified to site-specific conditions as recommended by the guidance document. The checklist will be completed annually and submitted with the Main Post annual long-term monitoring report. The checklist will also be used to assist in compiling information for the five-year review.

Are there any extraction wells at the property?		X	
Are there any proposed plans for property sale, future development, construction or demolition activities at the property?		X	
Are there any issues with site access for monitoring?		X	
V. Response Actions			
Item	Yes	No	Comments
Were violations of the LUCs present ?		X	There were no LUC violations at the Site, but the Army plans to work with the property owner on a better notification process - see below.
Are there Response Actions necessary based on the violations?		X	No formal Response Actions were necessary, but the Army sent a letter to John Bounds (Environmental, Health, and Safety Manager at O'Reilly) on April 19, 2023 to express concerns that the Army was not notified when the spill occurred. The Army reiterated that (a) the LUC implementation plan specifies notification to the Army of excavations (planned or emergency) that may involve soil and groundwater, and (b) the deed prohibits any activities that may interfere with the Army's selected remedy.
Are modifications/ terminations of LUC's necessary?		X	
Have Enforcement Actions been taken during this reporting period?		X	

Annual Land Use Control Plan Checklist for AOC 43G

This checklist has been developed from the USEPA guidance document Comprehensive Five Year Review Guidance dated June 2001 (OSWER No. 9355.7-03B-P) and from Section 4.0 of the 2015 Long-Term Monitoring Plan, Devens, Massachusetts. The Checklist was modified to site-specific conditions as recommended by the guidance document. The checklist will be completed annually and submitted with the Main Post annual long-term monitoring report. The checklist will also be used to assist in compiling information for the five-year review.

I. Site Information			
Site Name/Location: AOC 43G	Name/Affiliation: Ian Martz / Arcadis		
Remedy Includes: Long Term Monitoring, Institutional Controls			
Inspection Date: December 14, 2022			
Participants: Grace Sheckler (Arcadis), Brent Smith (USACE)			
II. Documentation and Records			
Item	Yes	No	Comments
Any related notices filed with Harvard, MA?		X	
Any related Department of Public Works permits found?		X	
Any related zoning permits or variances found?		X	
Any related Conservation Commission findings, proposals, or notices of intent found?		X	
III. Physical On-Site Inspection			
Item	Yes	No	Comments
Any evidence of development present in the area of the remedy?		X	
Any damage to on-site monitoring wells?	X		Some bollards and wooden stakes installed around monitoring wells are in need of replacement/repair; this was observed previously and well repairs will be scheduled during planned future site activities.
Is there evidence of damage to the remedy?		X	
Any groundwater extraction wells present?		X	
Is there sufficient access to the site for monitoring?	X		
Any signs of increased exposure potential?		X	
V CX			
Name of Interviewer: Ian Martz (Arcadis)			
Name of Interviewee: Penelope Reddy - USACE			
Contact Information: penelope.w.reddy@usace.army.mil, 978-318-8160			
Interview Notes: Emailed final 2021 LUC forms to Penelope Reddy for review on 1/25/2023 and received response via phone conversation on 2/8/2023			
Site Update: The Army is currently investigating PFAS which have been detected at the Former Fort Devens. A record-of-decision has not been completed for PFAS.			

Annual Land Use Control Plan Checklist for AOC 43G

This checklist has been developed from the USEPA guidance document Comprehensive Five Year Review Guidance dated June 2001 (OSWER No. 9355.7-03B-P) and from Section 4.0 of the 2015 Long-Term Monitoring Plan, Devens, Massachusetts. The Checklist was modified to site-specific conditions as recommended by the guidance document. The checklist will be completed annually and submitted with the Main Post annual long-term monitoring report. The checklist will also be used to assist in compiling information for the five-year review.

Item	Yes	No	Comments
Is interviewee familiar with the land use controls imposed upon the property & documentation of these controls?	X		
Are there any extraction wells at the property?		X	
Are there any proposed plans for property sale, future development, construction, or demolition activities at the property?		X	None - property remains part of Fort Devens
Are there any issues with site access for monitoring?		X	
V. Response Actions			
Item	Yes	No	Comments
Were violations of the LUCs present ?		X	
Are there Response Actions necessary based on the violations?		X	
Are modifications/ terminations of LUC's necessary?		X	
Have Enforcement Actions been taken during this reporting period?		X	

Annual Land Use Control Plan Checklist for AOC 57

This checklist has been developed from the USEPA guidance document Comprehensive Five Year Review Guidance dated June 2001 (OSWER No. 9355.7-03B-P) and from Section 4.0 of the 2015 Long-Term Monitoring Plan, Devens, Massachusetts. The Checklist was modified to site-specific conditions as recommended by the guidance document. The checklist will be completed annually and submitted with the Main Post annual long-term monitoring report. The checklist will also be used to assist in compiling information for the five-year review.

I. Site Information			
Site Name/Location: AOC 57 - Area 2 and Area 3		Name/Affiliation: Ian Martz / Arcadis	
Remedy Includes: Long Term Monitoring, Institutional Controls, Wetlands protection			
Inspection Date: December 14, 2022			
Participants: Grace Sheckler (Arcadis), Brent Smith (USACE)			
II. Documentation and Records			
Item	Yes	No	Comments
Any related notices filed with Devens Enterprise Commission?		X	
Any related Department of Public Works permits found?		X	Some brush cutting performed to maintain trail area (no intrusive activities)
Any related zoning permits or variances found?		X	
Any related Conservation Commission findings, proposals or notices of intent found?		X	
III. Physical On-Site Inspection			
Item	Yes	No	Comments
Is there evidence of damage to the remedy?		X	
Any damage to on-site monitoring wells?		X	New standpipe installed on one monitoring well (57M-96-12X) on May 18, 2022. Minor repairs needed to two additional monitoring wells (57M-03-06X, 57M-03-05X), PVC riser needs to be cut down slightly in order for the outer casing to be locked properly. Wells will be repairs during future site activities.
Any groundwater extraction wells present?		X	
Is there sufficient access to the site for monitoring?	X		
Any signs of increased exposure potential?		X	
IV. Interview			
Name of Interviewer: Ian Martz (Arcadis)			
Name of Interviewee: Neil Angus (Devens Enterprise Commission), Anne-Marie Dowd (MassDevelopment), Meg Delorier (MassDevelopment)			
Contact Information: neilangus@devensec.com, 978-772-8831 x3334; amdowd@massdevelopment.com, 857-345-2859; mdelorier@massdevelopment.com, 978-784-2929			
Interview Notes: Emailed final 2021 LUC forms to the above contacts for review on 1/13/2023. Performed phone interview on 1/27/2023.			

Annual Land Use Control Plan Checklist for AOC 57

This checklist has been developed from the USEPA guidance document Comprehensive Five Year Review Guidance dated June 2001 (OSWER No. 9355.7-03B-P) and from Section 4.0 of the 2015 Long-Term Monitoring Plan, Devens, Massachusetts. The Checklist was modified to site-specific conditions as recommended by the guidance document. The checklist will be completed annually and submitted with the Main Post annual long-term monitoring report. The checklist will also be used to assist in compiling information for the five-year review.

Site Update: The Army is currently investigating PFAS which have been detected at the Former Fort Devens. A record-of-decision has not been completed for PFAS.

Item	Yes	No	Comments
Is interviewee familiar with the land use controls imposed upon the property & documentation of these controls?	X		
Are there any extraction wells at the property?		X	
Are there any proposed plans for property sale, future development, construction, or demolition activities at the property?		X	
Are there any issues with site access for monitoring?		X	
V. Response Actions			
Item	Yes	No	Comments
Were violations of the LUCs present ?		X	
Are there Response Actions necessary based on the violations?		X	
Are modifications/ terminations of LUCs necessary?		X	
Have Enforcement Actions been taken during this reporting period?		X	

Annual Land Use Control Plan Checklist for AOC 69W

This checklist has been developed from the USEPA guidance document Comprehensive Five Year Review Guidance dated June 2001 (OSWER No. 9355.7-03B-P) and from Section 4.0 of the 2015 Long-Term Monitoring Plan, Devens, Massachusetts. The Checklist was modified to site-specific conditions as recommended by the guidance document. The checklist will be completed annually and submitted with the Main Post annual long-term monitoring report. The checklist will also be used to assist in compiling information for the five-year review.

I. Site Information			
Site Name/Location: AOC 69W		Name/Affiliation: Ian Martz / Arcadis	
Remedy Includes: Long Term Monitoring, Institutional Controls			
Inspection Date: December 7, 2022			
Participants: Grace Sheckler (Arcadis), Brent Smith (USACE)			
II. Documentation and Records			
II. Documentation and Records	Yes	No	Comments
Any related notices filed with Devens Enterprise Commission?		X	
Any related Department of Public Works permits found?		X	
Any related zoning permits or variances found?		X	
Any related Conservation Commission findings, proposals, or notices of intent found?		X	
III. Physical On-Site Inspection			
Item	Yes	No	Comments
Any evidence of new penetrations or repaved cut marks present at the site?		X	
Is there evidence of damage to the remedy?		X	
Any damage or change to area overlying the ESMA?		X	
Any damage to on-site monitoring wells?	X		Well ZWM-99-22X has a cracked roadbox, previously identified as needing repairs (will be addressed during future site activities).
Any groundwater extraction wells present?		X	
Is there sufficient access to the site for monitoring?	X		A vegetation removal event was completed from October 27-31, 2022 to improve access to monitoring wells in wooded areas. The work was coordinated with MassDevelopment and the property owner.
Any signs of increased exposure potential?		X	
IV. Interview #1			
Name of Interviewer: Ian Martz (Arcadis)			
Name of Interviewee: Neil Angus (Devens Enterprise Commission), Anne-Marie Dowd (MassDevelopment), Meg Delorier (MassDevelopment)			
Contact Information: neilangus@devensec.com, 978-772-8831 x3334; amdowd@massdevelopment.com, 857-345-2859; mdelorier@massdevelopment.com, 978-784-2929			
Interview Notes: Emailed final 2021 LUC forms to the above contacts for review on 1/13/2023. Performed phone interview on 1/27/2023.			
Site Update: The Army is currently investigating PFAS which have been detected at the Former Fort Devens. A record-of-decision			

Annual Land Use Control Plan Checklist for AOC 69W

This checklist has been developed from the USEPA guidance document Comprehensive Five Year Review Guidance dated June 2001 (OSWER No. 9355.7-03B-P) and from Section 4.0 of the 2015 Long-Term Monitoring Plan, Devens, Massachusetts. The Checklist was modified to site-specific conditions as recommended by the guidance document. The checklist will be completed annually and submitted with the Main Post annual long-term monitoring report. The checklist will also be used to assist in compiling information for the five-year review.

Item	Yes	No	Comments
Is interviewee familiar with the land use controls imposed upon the property & documentation of these controls?	X		
Are there any extraction wells at the property?		X	
Are there any proposed plans for property sale, future development, construction, or demolition activities at the property?	X		Retaining wall/sidewalk project planned by charter school is scheduled to be completed in 2023 (see Interview #2).
Were any excavations, planned or emergency, conducted in the Excavated Soils Management Area (ESMA)?		X	
Are there any issues with site access for monitoring?		X	

IV. Interview #2

Name of Interviewer: Ian Martz / Arcadis

Name of Interviewee: Michelle McKenna - Business Manager, Francis W. Parker Charter Essential School

Contact information: mmckenna@theparkerschool.org, 978-772-3293

Interview Notes: Sent email with interview questions to Ms. McKenna on 1/25/2023, received response on 1/25/2023; responses are recorded below.

Item	Yes	No	Comments
Is interviewee familiar with the land use controls imposed upon the property & documentation of these controls?	X		
Are there any extraction wells at the property?		X	
Are there any proposed plans for property sale, future development, construction, or demolition activities at the property?	X		Planned retaining wall/sidewalk project is anticipated to be completed in 2023. The property owner is currently working with a landscape architect to complete the study, survey, and plans.
Were any excavations, planned or emergency, conducted in the ESMA?		X	No. The above retaining wall/sidewalk project is scheduled to be completed in 2023. The property owner is presently working with an environmental services company and licensed site professional to develop a soil management plan and health & safety plan.
Are there any issues with site access for monitoring?		X	

V. Response Actions

Annual Land Use Control Plan Checklist for AOC 69W

This checklist has been developed from the USEPA guidance document Comprehensive Five Year Review Guidance dated June 2001 (OSWER No. 9355.7-03B-P) and from Section 4.0 of the 2015 Long-Term Monitoring Plan, Devens, Massachusetts. The Checklist was modified to site-specific conditions as recommended by the guidance document. The checklist will be completed annually and submitted with the Main Post annual long-term monitoring report. The checklist will also be used to assist in compiling information for the five-year review.

Item	Yes	No	Comments
Were violations of the LUCs present ?		X	
Are there Response Actions necessary based on the violations?		X	
Are modifications/ terminations of LUC's necessary?		X	
Have Enforcement Actions been taken during this reporting period?		X	

Annual Land Use Control Plan Checklist for DCL

This checklist has been developed from the USEPA guidance document Comprehensive Five Year Review Guidance dated June 2001 (OSWER No. 9355.7-03B-P) and from Section 4.0 of the 2015 Long-Term Monitoring Plan, Devens, Massachusetts. The Checklist was modified to site-specific conditions as recommended by the guidance document. The checklist will be completed annually and submitted with the Main Post annual long-term monitoring report. The checklist will also be used to assist in compiling information for the five-year review.

I. Site Information			
Site Name/Location: DCL	Name/Affiliation: Ian Martz / Arcadis		
Remedy Includes: Long Term Monitoring, Institutional Controls			
Inspection Date: December 1, 2022			
Participants: Ian Martz (Arcadis), Desmond Bedard (Arcadis), Brent Smith (USACE)			
II. Documentation and Records			
Item	Yes	No	Comments
Any related notices filed with Devens Enterprise Commission?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Any related Department of Public Works permits found?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Any related zoning permits or variances found?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Any related Conservation Commission findings, proposals, or notices of intent found?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
III. Physical On-Site Inspection			
Item	Yes	No	Comments
Any evidence of development present in the area of the remedy?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Any damage to on-site monitoring wells?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Is there evidence of damage to the remedy?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Any groundwater extraction wells present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Is there sufficient access to the site for monitoring?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Any signs of increased exposure potential?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
IV. Interview			
Name of Interviewer: Ian Martz (Arcadis)			
Name of Interviewee: Neil Angus (Devens Enterprise Commission), Anne-Marie Dowd (MassDevelopment)			
Contact Information: neilangus@devensec.com, 978-772-8831 x3334; amdowd@massdevelopment.com, 857-345-2859			
Interview Notes: Emailed final 2021 LUC forms to the above contacts for review on 1/13/2023. Performed phone interview on 1/27/2023.			
Site Update: The Army is currently investigating PFAS which have been detected at the Former Fort Devens. A record-of-decision has not been completed for PFAS.			

Annual Land Use Control Plan Checklist for DCL

This checklist has been developed from the USEPA guidance document Comprehensive Five Year Review Guidance dated June 2001 (OSWER No. 9355.7-03B-P) and from Section 4.0 of the 2015 Long-Term Monitoring Plan, Devens, Massachusetts. The Checklist was modified to site-specific conditions as recommended by the guidance document. The checklist will be completed annually and submitted with the Main Post annual long-term monitoring report. The checklist will also be used to assist in compiling information for the five-year review.

Item	Yes	No	Comments
Is interviewee familiar with the land use controls imposed upon the property & documentation of these controls?	X		
Are there any extraction wells at the property?		X	
Are there any proposed plans for property sale, future development, construction, or demolition activities at the property?		X	
Are there any issues with site access for monitoring?		X	
V. Response Actions			
Item	Yes	No	Comments
Were violations of the LUCs present ?		X	
Are there Response Actions necessary based on the violations?		X	
Are modifications/terminations of LUC's necessary?		X	
Have Enforcement Actions been taken during this reporting period?		X	

Inspection Checklist for DCL Contributor Sites

This checklist has been developed from the USEPA guidance document Comprehensive Five Year Review Guidance dated June 2001 (OSWER No. 9355.7-03B-P) and from Section 4.0 of the 2015 Long-Term Monitoring Plan, Devens, Massachusetts. The Checklist was modified to site-specific conditions as recommended by the guidance document. The checklist will also be used to assist in compiling information for the five-year review.

I. Site Information			
Site Name/Location: DCL Contributor Site AOC 9 Filter Bed Road, Ayer, MA		Name/Affiliation: Ian Martz / Arcadis	
Remedy Includes: No further Action. The site was transferred from the Army to MassDevelopment in 2006 as defined in the Finding of Suitability to Transfer (FOST) dated February 2005. Inspections are conducted to verify no change in site conditions since remedial action completion in 2002.			
Use Restrictions: AOC 9 (Lease parcel A2A) is limited to commercial and industrial uses.			
Inspection Date: December 14, 2022			
Participants: Grace Sheckler (Arcadis), Brent Smith (USACE)			
II. Documentation and Records			
Item	Yes	No	Comments
Any related notices filed with Devens Enterprise Commission?		X	
Any related Department of Public Works permits found?		X	
Any related zoning permits or variances found?		X	
Any related Conservation Commission findings, proposals or notices of intent found?		X	
III. Physical On-Site Inspection			
Item	Yes	No	Comments
Any evidence of new construction or excavation present in the area of the remedy?		X	
Is there evidence of damage to the remedy?		X	
Any groundwater extraction wells present?		X	
Is there sufficient access to the site for monitoring?	X		
Any signs of increased exposure potential?		X	
IV. Response Actions			
Item	Yes	No	Comments
Were violations of the LUCs present ?		X	
Are there Response Actions necessary based on the violations?		X	
Are modifications/terminations of LUC's necessary?		X	
Have Enforcement Actions been taken during this reporting period?		X	

Inspection Checklist for DCL Contributor Sites

This checklist has been developed from the USEPA guidance document Comprehensive Five Year Review Guidance dated June 2001 (OSWER No. 9355.7-03B-P) and from Section 4.0 of the 2015 Long-Term Monitoring Plan, Devens, Massachusetts. The Checklist was modified to site-specific conditions as recommended by the guidance document. The checklist will also be used to assist in compiling information for the five-year review.

I. Site Information			
Site Name/Location: DCL Contributor Site AOC 40 Patton Road, Ayer, MA		Name/Affiliation: Ian Martz / Arcadis	
Remedy Includes: No further Action. The site was transferred from the Army to MassDevelopment in 2006 as defined in the Finding of Suitability to Transfer (FOST) dated February 2005. Inspections are conducted to verify no change in site conditions since remedial action completion in 2002.			
Use Restrictions: AOC 40 (Lease parcel A4) is limited to open space and recreational uses.			
Inspection Date: December 14, 2022			
Participants: Grace Sheckler (Arcadis), Brent Smith (USACE)			
II. Documentation and Records			
Item	Yes	No	Comments
Any related notices filed with Devens Enterprise Commission?		X	
Any related Department of Public Works permits found?		X	
Any related zoning permits or variances found?		X	
Any related Conservation Commission findings, proposals, or notices of intent found?		X	
III. Physical On-Site Inspection			
Item	Yes	No	Comments
Any evidence of new construction or excavation present in the area of the remedy?		X	
Is there evidence of damage to the remedy?		X	
Any groundwater extraction wells present?		X	
Is there sufficient access to the site for monitoring?	X		
Any signs of increased exposure potential?		X	
IV. Response Actions			
Item	Yes	No	Comments
Were violations of the LUCs present ?		X	
Are there Response Actions necessary based on the violations?		X	
Are modifications/terminations of LUC's necessary?		X	
Have Enforcement Actions been taken during this reporting period?		X	

Inspection Checklist for DCL Contributor Sites

This checklist has been developed from the USEPA guidance document Comprehensive Five Year Review Guidance dated June 2001 (OSWER No. 9355.7-03B-P) and from Section 4.0 of the 2015 Long-Term Monitoring Plan, Devens, Massachusetts. The Checklist was modified to site-specific conditions as recommended by the guidance document. The checklist will also be used to assist in compiling information for the five-year review.

I. Site Information			
Site Name/Location: DCL Contributor Site SA13 Lake George Street, Harvard, MA	Name/Affiliation: Ian Martz / Arcadis		
Remedy Includes: No further Action. The site was transferred from the Army to MassDevelopment in 2006 as defined in the Finding of Suitability to Transfer (FOST) dated February 2005. Inspections are conducted to verify no change in site conditions since remedial action completion in 2001.			
Use Restrictions: SA13 (Lease parcel A8) is limited to commercial and industrial uses.			
Inspection Date: December 14, 2022			
Participants: Desmond Bedard (Arcadis), Brent Smith (USACE)			
II. Documentation and Records			
Item	Yes	No	Comments
Any related notices filed with Devens Enterprise Commission?		X	
Any related Department of Public Works permits found?		X	
Any related zoning permits or variances found?		X	
Any related Conservation Commission findings, proposals or notices of intent found?		X	
III. Physical On-Site Inspection			
Item	Yes	No	Comments
Any evidence of new construction or excavation present in the area of the remedy?		X	No - but there were several new survey stakes installed throughout the SA boundaries. MassDevelopment was contacted for more information on the purpose of the stakes. They indicated that there is a tentative plan to redevelop the property (non-residential).
Is there evidence of damage to the remedy?		X	
Any groundwater extraction wells present?		X	
Is there sufficient access to the site for monitoring?	X		Area is accessible in the winter, but may be more difficult/overgrown in other seasons.
Any signs of increased exposure potential?		X	
IV. Response Actions			
Item	Yes	No	Comments
Were violations of the LUCs present ?		X	
Are there Response Actions necessary based on the violations?		X	
Are modifications/terminations of LUC's necessary?		X	
Have Enforcement Actions been taken during this reporting period?		X	

Inspection Checklist for Housing Areas

I. Grant/Oak/Maple HA and Impact Area Annual Review Checklist			
Site Name/Location: Grant HA and Impact Area		Name/Affiliation: Ian Martz / Arcadis	
Remedy Includes: Long Term Monitoring, Institutional Controls			
Inspection Date: December 21, 2022			
Participants: Spencer Gust (Seres), Brent Smith (USACE), Hugh Sease (ONEIDA), Rich Holcomb (CFS), Neil Angus			
II. Physical On-Site Inspection (Impact Area)			
Item	Yes	No	Comments
Any UXO discovered? If yes, any surface or near surface UXO?		X	The physical inspection was conducted with a Schonstedt HeliFlux Magnetic Locator, Model GA-52Cx which has the capability to detect a 37mm round down to a depth of approximately 12-14 inches below ground surface. No surficial UXOs were detected.
Is there evidence of damage to the fencing and signage?	X		<p>Fencing was observed to be in good condition, with the exception of a small area that was damaged by a fallen tree; the fence will be scheduled for repair. Multiple cases of minor damage to the topline of the fence; the fence is still functional in these areas, but this will be noted for future repairs.</p> <p>The access gates were observed to be in good condition. Locks on the gates and keys around the site are inconsistent and some of the locks are hard to open; locks will be standardized prior to the next inspection.</p> <p>Signage was clearly visible and present along the perimeter of the fence line.</p>
Any evidence of unauthorized access?		X	
III. Interview			
Name of Interviewer: Ian Martz (Arcadis)			
Name of Interviewee: Neil Angus (Devens Enterprise Commission), Anne-Marie Dowd (MassDevelopment), Rich Holcomb (Commonwealth Fusion Systems), Kathleen Brill (Foley Hoag LLP)			
Contact Information: neilangus@devensec.com, 978-772-8831 x3334; amdowd@massdevelopment.com, 857-345-2859; rholcomb@cfs.energy, 508-667-4582; kbrill@foleyhoag.com, 617-832-1229			
Interview Notes: Emailed final 2021 LUC forms to the above contacts for review on 1/23/2023. Performed phone interview on 1/27/2023.			
Site Updates: LUCs for Grant Housing Area and 37-mm Impact Area are defined in the 2011 LUCIP. The Grant HA is currently zoned for residential reuse and the Impact Area is restricted for future use. The remedy for the Oak and Maple Housing Area was incorporated into the Grant HA and Impact Area site via a 2014 Explanation of Differences (ESD). The remedy included LUC interviews. A LUCIP addendum for the Oak and Maple HA (as well as a portion of the Grant HA) was completed in April 2021; this "Restricted Area" is currently zoned for commercial uses (innovation and technology business).			
Item	Yes	No	Comments
Impact Area			
Any UXO discovered?		X	
Was any work conducted or planned regarding utility repair or emergency work?		X	

Inspection Checklist for Housing Areas

Restricted Area (Former Oak and Maple HA, portion of Grant HA)			
Any UXO discovered?		X	
Is the Site-Specific Soil Management Plan (SSSMP) and UXO information pamphlet available on the Devens Enterprise Commission website?	X		
Was a current version of the SSSMP distributed to MassDevelopment (and other current/future owners of property within the Restricted Area), Devens Fire Department, and local/State Police?	X		
Did ground intrusive construction activities occur during the reporting period?		X	
Were construction contractors provided with a current version of the soils management policy?			N/A - no soils management work completed in 2022.
Were all contractors required to attend the UXO awareness training prior to commencing ground intrusive activities?			N/A - no intrusive activities completed in 2022.
Were any amendments to the Notice of Activity and Use Limitation (NAUL) recorded/executed?		X	
Was a physical inspection conducted in the Restricted Area?			N/A - no physical inspections of the restricted area were required in 2022.
Unrestricted/Residential Use Area (Grant HA)			
Any UXO discovered?	X		Yes - on November 22, 2022, the Devens Fire Department and State Police Bomb Squad responded and destroyed a hand grenade. The grenade was found in a forested area in the western part of the former Grant HA (adjacent to the Oxbow National Wildlife Refuge); the item was found and unearthed by an individual using a metal detector. No injuries or damage were reported.
Is the Soil Management Plan and UXO information pamphlet available on the Devens Enterprise Commission website?	X		
Has the required educational pamphlet/utility bill insert been included in utility bill mailings to owners, lessees, and/or tenants?	X		Mailings sent on an annual basis for existing customers and as-needed for any new customers.
Has the educational pamphlet/utility bill insert been posted in a conspicuous location?	X		A total of seven signs are posted in the vicinity previously, and are in good condition. A semi-permanent kiosk was constructed in 2022 in Central Park along Grant Road.
Did ground intrusive construction activities occur during the reporting period?	X		Construction work completed on a total of three new duplexes on Powell Street (units 1A/1B, 3A/3B, and 5A/5B). Foundation work was started on a planned multi-family buildings on 77 Grant Road; construction is currently on hold.

Inspection Checklist for Housing Areas

Were construction contractors provided with a current version of the soils management policy?	X		
Were all contractors required to attend the UXO awareness training prior to commencing ground intrusive activities?	X		
Was the Supplemental Deed Notice included in deeds conveying portions of the unrestricted/residential use area?	X		
Was a physical inspection conducted at the unrestricted/residential use area?	X		Yes, routine site walks and inspections completed by MassDevelopment and the Devens Enterprise Commission as a part of property redevelopment.
IV. Response Actions			
Item	Yes	No	Comments
Were violations of the LUCs present ?		X	
Are there Response Actions necessary based on the violations?		X	
Are modifications/ terminations of LUC's necessary?		X	
Have Enforcement Actions been taken during this reporting period?		X	



DEPARTMENT OF THE ARMY
OFFICE OF THE DEPUTY CHIEF OF STAFF, G-9
600 ARMY PENTAGON
WASHINGTON, DC 20310-0600

19 April 2023

SUBJECT: Land Use Controls and Diesel Fuel Release at 15 Independence Avenue,
Devens, MA

Transmitted via E-mail

John Bounds
Environmental, Health, & Safety Manager
O'Reilly Auto Parts - Risk Management Department
233 S. Patterson Ave
Springfield, MO 65802

Dear Mr. Bounds:

This letter is provided to notify you, as the property owner representative, of the requirement to comply with Land Use Controls (LUCs) in accordance with certain deed provisions, a notice of potential violation of those controls, and a request to provide a description of corrective actions you will take to prevent such potential violations in the future. The Army conducts long-term monitoring (LTM) and annual LUC inspections as part of the selected remedy under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) at the former Fort Devens property. This annual inspection includes interviews with personnel at the O'Reilly Auto Parts Distribution Center at 15 Independence Avenue in Devens, Massachusetts. The remedy selected under CERCLA addressed contamination related to former Army activities at Area of Contaminations (AOC) 32 and 43A located at the Distribution Center, which is still a National Priorities Site. The deed transferring the property from the Army to Mass Development Finance Corporation (MassDev) included covenants that run with the land in perpetuity and bound all future owners of the Former Fort Devens property to comply with LUCs and any all authorized CERCLA remedies.

The CERCLA remedy at AOC 32 and 43A restricted the use of groundwater at the site, preventing both industrial and potable use of groundwater. During the most recent LUC inspection on December 7, 2022, the on-site facility manager and safety manager pointed out several concrete cut-outs to the east of the building. The facility manager said he was told the cut-outs were for potential drilling locations and asked if they could put road plates over the cut-outs as they were potential hazards and had been there over a year. The USACE personnel in the field did not know why the cut-outs were present. As a follow-up, the Army inquired regarding the origin of the cut-outs and received a response from Joe Morgan with O'Reilly via email on February 20, 2023, that the concrete cut-outs were from ground sampling done after a fluid leak from a vehicle was observed.

The current Army team was unaware of the spill and would like to confirm with you that O'Reilly notified the Army of the spill and the drill work, as our records do not show that a

notification was sent. The spill was not discussed during the annual LUC inspection and interviews in 2022. The Army did review the Massachusetts Department of Environmental Protection (MassDEP) website following the email regarding the ground sampling and identified a diesel fuel release on the property from a vehicle leak in August 2021 (MassDEP Release Tracking Number 2-21677). Based on the available report prepared by Omni Environmental Group in October 2021, it appears actions were undertaken to address the release, including soil sampling, soil removal, and gauging of wells. It also appears that the well box for Army well 32Z-01-10XBR (referred to as MW-1 in the report prepared by Omni Environmental Group in October 2021) may have been replaced as part of the soil removal.

As stated above, the property is subject to a CERCLA remedy, which require all future property owners to acknowledge the Federal Facility Agreement and any LUCs on former Army property. The Army is concerned because intrusive activity was undertaken and not reported, though it does not appear an actual violation of the restriction on the use of groundwater occurred. However, as part of the Army's Long-Term Monitoring and Maintenance Plan (LTMMP), site owners and operators are asked if any soil excavations are planned or if any emergencies were undertaken that did or could involve soil or groundwater movement. There does not appear to have been any communication about the diesel spill or replacement of an Army well for over a year. Please provide verification that the Army was notified of the diesel spill in August of 2021 and the steps you will implement to ensure notification is provided in the future, should there be any additional spills, excavation, or groundwater access activities.

The 2022 Annual Report is being finalized and it will include a statement that the property owner (O'Reilly) did not violate the Land Use Restriction on the prohibition of using groundwater for industrial or potable purposes but a better notification process should be implemented to inform the Army of soil disturbances and groundwater access activities.

My point of contact for this action is Penny Reddy at the US Army Corps of Engineers – New England District (USACE), who can be reached at (978) 318-8160/ penelope.w.reddy@usace.army.mil; or I can be reached at (703) 371-6785 (telework)/(703) 545-2487 (office)/ Thomas.A.Lineer.civ@army.mil.

Sincerely,

Thomas Lineer
BRAC Program Manager
Army Environmental Division
Installation Services Directorate

Enclosure

cc:
Penny Reddy, USACE (e-copy)



33 Andrews Parkway
Devens, MA 01434

Main: 978-784-2900
Fax: 978-772-8879

massdevelopment.com

January 5, 2023

Dear Devens Resident or Business:

The attached informational fact sheet is presented to you as a reminder of the history of Devens' former use as an active military installation and the possibility that unexploded ordnance ("UXO") could be encountered in Devens. The fact sheet provides you with a brief but thorough time line of the studies and work that have been undertaken to identify and remove UXO in Devens.

All residents and businesses within the Grant Road Housing Area (as shown on the plan in the fact sheet) receive this notice after opening a new utility account and annually thereafter. This is part of the educational program on UXAO that is required by the U.S. Army's Land Use Control Implementation Plan (LUCIP) and supported by the U.S. Environmental Protection Agency (EPA) and Massachusetts Department of Environmental Protection (DEP).

If you have any questions or comments on this program, please feel free to call me at (978) 784-2933. Thank you.

Sincerely,

A handwritten signature in black ink, appearing to read "Meg Delorier", with a long horizontal flourish extending to the right.

Meg Delorier
Acting Executive Vice President, Devens

IMPORTANT INFORMATION ABOUT UNEXPLODED ORDNANCE (UXO) FOR DEVENS RESIDENTS, EMPLOYEES, AND VISITORS

Devens is located on land once owned by the U.S. Army. For nearly 80 years from World War I until 1996, Devens' 4,400 acres were used for housing, research, education, administration, and military training purposes.

What parts of Devens were used for military training?

The Army used a 130-acre parcel called the Grant Road Housing Area for a firing range (including a firing point) and the adjacent Oak/Maple Housing areas (32 acres) principally for 37-millimeter anti-tank shells between World War I and World War II. A firing point is an area from which Army personnel fired artillery and other weapons at a target for training purposes. A firing range is the area between the firing point and the target. The Army stopped using the firing range in the 1930s. From the 1960s until the base closed in 1996, the area was occupied by approximately 260 homes for military families.

Where was the firing range?

The firing point was located at the northern end of the Grant Road Housing Area. Targets were located in an "impact area" on the northern slope of Oak Hill that is now surrounded by a fence.

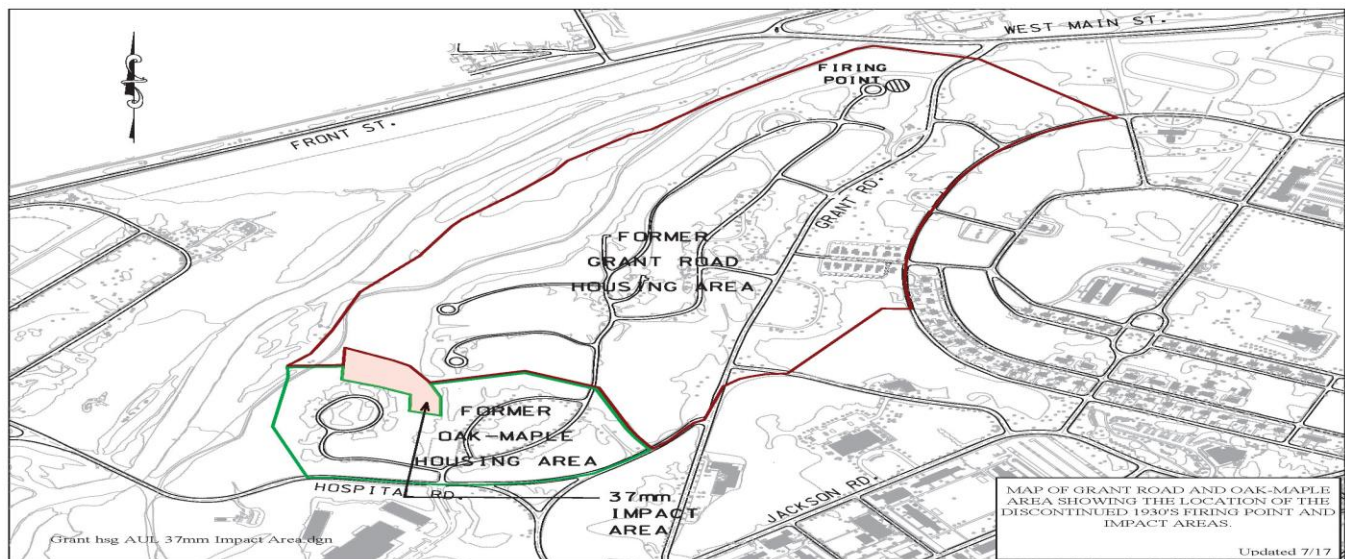


Figure 1. Map of Grant Road and Oak/Maple Housing Areas showing the location of the discontinued 1930's firing range impact area relative to now-demolished 1960's era military housing.

Was UXO found and removed?

In 1995 and 1996, as the base prepared to close, Army performed a munitions response investigation and subsequent removal action at portions of the Grant and Oak Housing Areas. Significant amounts of unexploded ordnance (UXO) and UXO scrap were found on the Oak Housing Area hillside (i.e. 37-mm Impact Area), located to the southwest of the Grant HA. In 2004 and 2005, the Army conducted a Preliminary Assessment/Site Inspection (PA/SI) and Supplemental Site Investigation (SSI) within the Grant HA and 37-mm Impact Area to assess whether military activities resulted in the release of munitions-related chemicals to soil and groundwater. Although no chemicals potentially related to UXO (i.e. munitions constituents) were detected, the 2008 PA/SI/SSI Report recommended that response alternatives involving land-use controls (LUCs) be considered for the 37-mm Impact Area and portions of the Grant HA to reduce explosive safety hazards and that a Munitions and Explosives of Concern (MEC) investigation be performed at the former Oak and Maple HAs to characterize potential MEC safety hazards and determine if additional removals and/or LUCs are warranted within these areas.

In 2006, to address concerns regarding potential remnant UXO within the 37-mm Impact Area and Grant HA, Mass Development issued results of a digital and analog ("mag, flag, and dig") geophysical survey and removal action conducted throughout the entire Grant Housing Area (HA) (former 37-mm artillery range) and northern portions of Oak and Maple HAs (located within the 37-mm firing fan/impact area). In total, an additional 31 UXO items and 17 other ordnance items were located and removed.

In 2010/2011, per recommendations detailed in the 2008 PA/SI/SSI Report, a MEC investigation was conducted at the former Oak and Maple HAs. Similar to the geophysical techniques utilized in 2006, a combination of digital and analog

methods were deployed to evaluate a portion (14 of 37 acres) of the former Oak and Maple HA property thought to have the greatest likelihood of MEC discovery . Although munitions debris (MD) was found scattered across several areas **within** both HAs, of the 3,647 anomalies investigated only 1 MEC item was found. The investigation concluded that the probability of encountering MEC within the previously developed former Oak and Maple HAs is considered to be low. In 2016, an additional 10 (100' X 100') grids and 13 concrete building slab footprints within the former Oak HA were surveyed using an analog, hand-held instrument. No MEC was recovered during this investigation.

Do I need to be concerned about unexploded shells or other ordnance?

UXO could remain in the housing and impact areas. However, the Army and MassDevelopment have taken all steps recommended by the U.S. Environmental Protection Agency (EPA) with the review and comment of the Massachusetts Department of Environmental Protection (DEP) to identify and remove UXO from the housing and impact areas. The Army and EPA, with the review and comment of DEP, concluded that (a) all identified UXO in the top 18 inches of the surface have been removed and (b) the presence of UXO deeper than 18 inches is unlikely given the primary type of UXO found—37-millimeter shells—the angle of penetration, soil conditions, and decades of frost heaves. Since technology cannot guarantee complete detection, the possibility remains of additional finds of UXO that could pose explosive safety hazards.

What does UXO look like and what should I do if I suspect I have found it?

UXO may appear as corroded bullets, shells of various sizes, or grenades. Below are pictures of UXO that might be found in Devens.



Figures 2 and 3. Pictured above is (at left) an intact 37mm anti-tank shell and (at right) a hand grenade. Both are shown with a standard 12-ounce beverage can.

The Department of Defense recommends that everyone—including children, family members, and landscapers—learn the three R's of UXO safety: recognize, retreat, and report.

- **RECOGNIZE** – When you may have encountered UXO.
- **RETREAT** – Do not touch, disturb, or move the UXO. Leave the area.
- **REPORT** – Call Devens Emergency Dispatch Center at (978) 772-7200 and report what you saw and where you saw it.

If you are conducting any activity that requires a building permit, call:

- Devens Enterprise Commission: (978) 772-8831

Awareness Briefings:

The Devens Fire Department conducts awareness briefings for contractors and other construction and utility personnel who intend to conduct ground-intrusive activities (such as digging) in Devens. These briefings instruct personnel on the steps both to recognize UXO and to follow should suspect UXO be encountered. Devens residents are also invited to attend an awareness briefing. To receive an awareness briefing, contact the Devens Fire Department at (978) 772-4600.

Where can I get more information?

For information on UXO and UXO removal, call:

- Devens Fire Department: (978) 772-4600
- MassDevelopment: (978) 784-2900

For additional information on the land use controls and implementation plan as well as the Devens Soil Management Policy and its related regulations, visit the Devens Enterprise Commission website at www.devensec.com or call the Devens Enterprise Commission at (978) 772-8831.

Appendix G

DCL Inspection Report

United States Army Corps of Engineers
New England District

Draft

**Appendix G –
2022 Geotechnical
Engineering Annual
Inspection Report**

**Devens Consolidation Landfill
2022 Annual Operations, Maintenance,
and Monitoring Report, Main Post
Former Fort Devens Army Installation
Devens, Massachusetts**

Contract No. W912WJ-19-D-0014

May 2023

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Attachments

Attachment 1 Photograph Log

Attachment 2 Inspection and Maintenance Checklist

Attachment 3 Landfill Gas Monitoring Log

Acronyms and Abbreviations

DCL	Devens Consolidation Landfill
LEL	lower explosive limit
ppm	part per million
RCRA	Resource Conservation and Recovery Act
S-A JV	SERES-Arcadis 8(a) Joint Venture 2
Tantara	Tantara Corporation

1 Introduction

The Resource Conservation and Recovery Act (RCRA) Subtitle C cap at the Devens Consolidation Landfill (DCL) was constructed with the following objectives:

- Eliminate the potential risk to human health and the environment associated with exposure to wastes
- Minimize off-site migration of contaminants
- Limit infiltration to the underlying waste within the landfill area, thereby minimizing leachate generation.

The landfill cap system was completed during fall 2002 and restoration of site staging areas was completed during spring 2003. The RCRA cap consists of the following layers:

- 12-inch-thick subgrade/leveling layer immediately above the waste materials
- Geocomposite gas collection/vent layer
- 40-mil very flexible polyethylene geomembrane
- Geocomposite drainage layer
- 12-inch-thick protective layer overlaid by an 18-inch-thick vegetative support layer capped with 6 inches of topsoil.

The DCL landfill general plan is shown on Figure 17 of the 2022 Annual Operations, Maintenance, and Monitoring Report, and landfill features are displayed in the attached Photograph Log (Attachment 1). Post-closure monitoring objectives and procedures are specified in the Operation and Maintenance Manual included in the Post-Closure Report. The United States Army Corps of Engineers, New England District, is responsible for operating, monitoring, and inspecting the DCL. Annual operation and maintenance activities include landfill gas monitoring, groundwater sampling, and monthly inspections of the leachate system. Leachate wastewater is permitted to discharge to the Devens wastewater sewer system through the authorized industrial wastewater discharge permit.

2 Landfill Cap Inspection

Personnel from the SERES-Arcadis 8(a) Joint Venture 2, LLC (S-A JV) and the United States Army Corps of Engineers inspected the DCL on December 1, 2022. The cap and adjacent area vegetation were mowed on November 15 to 23, 2022, by Tantara Corporation of Worcester, Massachusetts (Tantara). Observations were made regarding the site entry, vegetative cover, erosion, settlement, and general condition of the various features. Attachment 2 contains the Inspection and Maintenance Checklist, and Attachment 3 contains the Landfill Gas Monitoring Summary Table, which summarizes the inspection findings.

During the December 2022 inspection, the overall landfill cap and its surrounding perimeter drainage system were found to be in good condition, with no apparent overall settlement and limited evidence of erosion (Attachment 1, Photos 1 through 4). In general, the vegetative cap appeared healthy and is providing good coverage of the cap. As noted during previous inspections, some small, woody shrub species have invaded both the perimeter drainage system and the landfill cap. Woody vegetation was cut as flush to the to the ground as feasible during annual mowing, to promote growth of the grass cover and to prevent deep-rooted vegetation from forming.

2.1 Entries and Exit Inspection

Access roads are located on private property owned by the Massachusetts Development and Finance Agency. The security gate at the Patton Road (southern) entrance was in good condition, though it has observed to be unlocked since personnel from the S-A JV began routine inspections of the DCL in May 2021. The access road from the security gate extending to the leachate pump station was in good condition; no significant ruts, potholes, or eroded areas were observed.

2.2 Fence Inspection

The perimeter fence is in fair condition where it emanates from the security gate. The fence does not encircle the entirety landfill cap, but the fence (along with the security gate and perimeter drainage system) helps to minimize entry onto the landfill cap by motor vehicles. These access limitations appear to be adequate, as there were no signs of vandalism or other unauthorized entry around the west, north, or east perimeter of the landfill.

3 Drainage System Inspection

The perimeter drainage system is designed to drain surface water and infiltrated water off the cap system. It consists of the following components:

- Geocomposite drainage layer
- Grass bench drains on the cap with gabion slope drains
- A perimeter stone drain along the toe-of-slope
- Perimeter drainage channels
- A sediment detention basin with a riprap lined outlet area (located at the northeast corner of the landfill).

During the December 2022 inspection, observations were made regarding the vegetative cover, vegetation types, erosion, and general condition of the drainage system. No maintenance activities were performed during the inspection; however, vegetation removal was conducted as needed within the riprap during the mowing event on November 15 to 23, 2022. Attachment 2 contains the Inspection and Maintenance Checklist, which summarizes the findings of this inspection.

The cap drainage system was observed to be in good condition. Drainage channels were overall free of sediment and debris, with no significant settlement or stone displacement. The gabion slope drains were in good condition, with minimal vegetation present (Attachment 1, Photo 5 and 6). Minor damage was observed to a small section of wire in two of the northern gabion slope drains; this was likely caused by the mowing equipment and will be repaired during a future site visit. No significant vegetation remnants were present within the riprap. The perimeter toe drains were in good condition and appeared to be functioning properly, with no visible signs of erosion or developing slope stability problems.

The detention basin (northeast of the DCL) was in good condition overall (Attachment 1, Photo 7 and 8). Its pond drains, culvert, and outfall areas were in good condition and generally free of both debris and vegetative growth. The area should continue to be monitored for potential future erosion. If significant erosion occurs, then the area should be regraded and reseeded as part of annual landfill maintenance.

4 Gas Vent System Inspection

The DCL includes a passive gas venting system that was installed to facilitate the ventilation of any gases generated from the degrading waste material beneath the landfill cap system. The passive system consists of 11, 6-inch-diameter gas vents (V-1 to V-11) integrated into the geocomposite gas collection layer immediately beneath the 40-mil very flexible polyethylene geomembrane, and three landfill gas monitoring wells (LFGM-18-01 to LFGM-18-03) located between the landfill cap and the TaraVista Behavioral Health building, which is located at 85 Patton Road. The gas vent system was observed to be in good condition; all the gas vents were stable and upright, and all the bird/insect screens on the vents were in good condition. New vent identification tags were installed on each of the gas vents (Photo 9). Landfill gas monitoring well LFGM-18-01 was observed to be missing its protective roadbox lid (Photo 10); this was likely a result of mowing activities. The landfill gas monitoring wells was otherwise observed to be in good condition; a new roadbox lid will be installed at location LFGM-18-01 during a subsequent site visit.

On December 1, 2022, all gas vents and landfill gas monitoring points were monitored via two instruments for parameters of interest. A MultiRAE+ multi-gas monitor was used to check levels of volatile organic compounds, hydrogen sulfide, carbon monoxide, percent lower explosive limit (LEL), and oxygen. A Landtec GEM 2000 landfill gas monitor was used to check levels of oxygen, carbon dioxide, methane, and carbon monoxide. As shown in Attachment 3, gas monitoring showed that the parameters of interest ranged as follows:

- Via the MultiRAE+:
 - Volatile organic compounds – 0.0 parts per million (ppm; non-detect) at all locations
 - Hydrogen sulfide – 0.0 ppm at all locations
 - Carbon monoxide – 0.0 ppm at all locations
 - LEL – 0.0% at all locations
 - Oxygen – 17.8% to 21.9%
- Via the Landtec GEM 2000:
 - Oxygen – 17.4% to 22.5%
 - Carbon dioxide – 0.0% to 2.8%
 - Methane – 0.0% at all locations
 - Carbon monoxide – 0.0% to 0.1%

5 Recommendations and Corrective Actions

The following recommendations and corrective actions should be conducted for future maintenance of the landfill cap:

1. Continue the annual inspection of landfill cap components. The inspection should continue to be performed in the fall, soon after mowing is completed (i.e., within 1 to 2 weeks), and preferably within 48 hours after a precipitation event to help inspect the effectiveness of surface runoff in the drainage swales. Landfill gas monitoring should be performed on a dry day.
2. Continue mowing the landfill cap annually to control vegetative growth, as well as the adjacent stormwater detention pond to prevent woody and wetland plant species from encroaching onto the cap. Mowing should

not take place prior to September 1, when ground-nesting songbirds are mature enough to avoid being harmed.

3. Continue general landfill maintenance, such as clearing large/woody vegetative growth from the cap, drainage channels, and riprap. Small shrubs growing on the landfill cap should continue to be cut as flush to the ground as feasible during annual maintenance events.
4. Since the cap was completed in 2002, post-closure inspection and monitoring has been performed for 21 years. Planning should commence for the performance time and metrics to reduce long-term monitoring and sampling activities, or to perform them at a reduced frequency, after 30 years, in accordance with RCRA Subtitle C landfill cap regulations for post-closure monitoring periods of performance.

Attachment 1

Photograph Log

Photograph Log

Appendix G – Geotechnical Engineering Annual Inspection Report, Attachment 1
Former Fort Devens Army Installation – Devens Consolidation Landfill (DCL)



Photograph: 1

Description: Photo taken on top of the landfill cap (looking northwest) displaying general site conditions.

Location: DCL

Photograph taken by:
Desmond Bedard

Date:
December 1, 2022



Photograph: 2

Description: Photo taken of the western side of the landfill (looking north), displaying general site conditions.

Location: DCL

Photograph taken by:
Desmond Bedard

Date:
December 1, 2022

Photograph Log

Appendix G – Geotechnical Engineering Annual Inspection Report, Attachment 1
Former Fort Devens Army Installation – Devens Consolidation Landfill (DCL)



Photograph: 3

Description: Photo taken from the detention basin area (looking west), displaying general site conditions.

Location: DCL

Photograph taken by:
Desmond Bedard

Date:
December 1, 2022



Photograph: 4

Description: Photo taken of the southwest slope of the landfill cap (looking northeast), displaying general site conditions.

Location: DCL

Photograph taken by:
Brent Smith

Date:
December 1, 2022

Photograph Log

Appendix G – Geotechnical Engineering Annual Inspection Report, Attachment 1
Former Fort Devens Army Installation – Devens Consolidation Landfill (DCL)



Photograph: 5

Description: Photo taken of a northern gabion slope drain (looking south).

Location: DCL

Photograph taken by:
Brent Smith

Date:
December 1, 2022



Photograph: 6

Description: Photo taken of the northeastern gabion slope drain, looking northeast towards the detention basin.

Location: DCL

Photograph taken by:
Brent Smith

Date:
December 1, 2022

Photograph Log

Appendix G – Geotechnical Engineering Annual Inspection Report, Attachment 1
Former Fort Devens Army Installation – Devens Consolidation Landfill (DCL)



Photograph: 7

Description: Photo taken of the detention basin, looking west towards the landfill cap.

Location: DCL

Photograph taken by:
Desmond Bedard

Date:
December 1, 2022



Photograph: 8

Description: Photo of taken of the eastern landfill slope, looking east towards the leachate collection system and detention basin.

Location: DCL

Photograph taken by:
Brent Smith

Date:
December 1, 2022

Photograph Log

Appendix G – Geotechnical Engineering Annual Inspection Report, Attachment 1
Former Fort Devens Army Installation – Devens Consolidation Landfill (DCL)



Photograph: 9

Description: Photo taken of newly installed vent identification tag.

Location: DCL

Photograph taken by:
Brent Smith

Date:
December 1, 2022



Photograph: 10

Description: Photo taken of damaged landfill gas monitoring well LFGM-18-01. A new roadbox cover will be installed during a future site visit.

Location: DCL

Photograph taken by:
Brent Smith

Date:
December 1, 2022

Attachment 2

Inspection and Maintenance Checklist



Inspection & Maintenance Check List
 Devens Consolidation Landfill

Inspectors: Ian Martz (Arcadis), Desmond Bedard (Arcadis), Brent Smith (USACE)
 Date: 12/1/2022

Item	Description of Inspection Items	Checked (X)	Comments
Landfill Cap	Inspect for Eroded Areas	X	No eroded areas observed.
	Inspect for Settlement and Pondered Water	X	No significant settlement or ponded water observed.
	Inspect for Wetland Species Encroachment	X	No wetland species encroachment observed.
	Inspect Vegetated Areas	X	Landfill cap mowed from November 15-23, 2022. The vegetative cap appears healthy and provides good coverage of the cap. No evidence of large vegetation (roots >2 inches in diameter). Small shrubs (roots <2 inches in diameter) removed by Tantara during mowing to the extent practical. No significant ruts observed on cap slopes. No large animal burrows observed.
Drainage System	Inspect Stone Toe Drain	X	Good condition; small shrubs (roots <2 inches in diameter) removed during mowing
	Inspect Gabion Slope Drains	X	Limited vegetation observed. Minor damage observed to a small section of wire along the northeast and northwest slope drain; possibly caused by the mowing equipment; the wire will be repaired in a future site visit
	Inspect for Eroded Areas	X	No evidence of significant erosion.
	Inspect for Debris & Unwanted Vegetation in Drainage Channels	X	Good condition; small shrubs roots <2 inches in diameter) removed during mowing by Tantara
	Inspect Rip-Rap Areas	X	Vegetation and growth removed to the extent practical by Tantara.
Gas Vent System	Gas Monitoring Vents V-1 through V-11	X	The gas vent system was observed to be in good condition. One landfill gas monitoring well (LFGM-18-01) was observed to be missing the protective roadbox lid, which was likely removed inadvertently by the mowing equipment. A replacement roadbox lid will be installed in a future site visit. All gas vents and landfill gas monitoring wells were measured for landfill gas parameters.
	Inspect Vent Pipe and Bird Screen	X	All gas vents were stable, and screens were in good condition. New vent ID tags were installed on each gas vent
Security Fence	Inspect for Damage to or Breaches in Fencing	X	No damage to the fencing observed.
Access Road	Inspect for Erosion, Potholes and Rutting	X	No damage to the access road observed.

Description of Maintenance Activities Performed (as necessary):

1. Conducted landfill mowing from November 15-23, 2022, including removal of vegetation within the rip-rap areas.
2. Inspected gas vents and collected landfill gas readings.

The following maintenance and monitoring activities are recommended:

1. Continue mowing the landfill cap annually to control vegetative growth, as well as the adjacent stormwater detention pond to prevent woody and wetland plant species from encroaching onto the cap.
2. Continue annual inspections and general landfill maintenance, such as clearing large/woody vegetative growth from the cap, drainage channels, and rip-rap areas.

Attachment 3

Landfill Gas Monitoring Log

Landfill Gas Monitoring
Devens Consolidated Landfill - Devens, Massachusetts



Date: 12/1/2022
 Sampler(s): Ian Martz, Desmond Bedard
 Weather: windy/clear, upper 30s
 Barometer (in-Hg): 29.67 Time: 10:30 AM

Location ID	Time	VOC	H ₂ S	CO	LEL	O ₂	O ₂	CO ₂	CH ₄	CO	Remarks
		ppm Multi RAE +	ppm Multi RAE +	ppm Multi RAE +	% Multi RAE +	% Multi RAE +	% GEM 2000	% GEM 2000	% GEM 2000	% GEM 2000	
V-1	12:42 PM	0.0	0.0	0.0	0.0	21.8	22.2	0.2	0.0	0.0	
V-2	11:52 AM	0.0	0.0	0.0	0.0	20.9	22.0	0.2	0.0	0.0	
V-3	12:36 PM	0.0	0.0	0.0	0.0	21.9	22.1	0.0	0.0	0.1	
V-4	11:59 AM	0.0	0.0	0.0	0.0	21.0	22.3	0.1	0.0	0.0	
V-5	12:05 PM	0.0	0.0	0.0	0.0	20.9	22.1	0.1	0.0	0.0	
V-6	12:11 PM	0.0	0.0	0.0	0.0	20.9	22.0	0.1	0.0	0.0	
V-7	12:47 PM	0.0	0.0	0.0	0.0	21.2	21.5	0.1	0.0	0.0	
V-8	12:52 PM	0.0	0.0	0.0	0.0	21.4	21.7	0.1	0.0	0.0	
V-9	12:18 PM	0.0	0.0	0.0	0.0	20.9	22.4	0.1	0.0	0.0	
V-10	12:24 PM	0.0	0.0	0.0	0.0	20.9	22.5	0.0	0.0	0.0	
V-11	12:29 PM	0.0	0.0	0.0	0.0	21.0	21.5	0.2	0.0	0.0	
LFGM-18-01	11:26 AM	0.0	0.0	0.0	0.0	19.1	19.7	2.7	0.0	0.0	roadbox lid missing
LFGM-18-02	11:36 AM	0.0	0.0	0.0	0.0	17.8	17.4	2.8	0.0	0.0	
LFGM-18-03	11:47 AM	0.0	0.0	0.0	0.0	19.5	20.3	1.9	0.0	0.0	

Calibration Information:

1. Instrument: MultiRAE +, SN#152-M1984
 Calibrated with: C₄H₈, O₂, CO, H₂S, LEL
 Calibrated by: Desmond Bedard (Arcadis)

2. Instrument: Landtec GEM 5000+, SN# G 503255
 Calibrated with: C₄H₈, O₂, CO₂, H₂S, CH₄, LEL
 Calibrated by: Desmond Bedard (Arcadis)

Appendix H

Response to Comments



**US Army Corps
of Engineers®**

New England District
696 Virginia Road
Concord, Massachusetts
01742-2751

Project Name: Former Fort Devens Army Installation			
Location: Devens, Massachusetts		Reviewers:	Joanne Dearden (MassDEP) and Michael Daly (USEPA)
Document Name: Draft 2022 Annual Operations, Maintenance, and Monitoring Report, Main Post, Former Fort Devens Army Installation, Devens, Massachusetts, May 2023			
No.	Ref. Page / Para.	COMMENT	RESPONSE
Joanne Dearden (MassDEP) (11 July 2023)			
1.	Page 10, Sec. 3.3.1	MassDEP recommends providing text in the Report to indicate the results of the extractable petroleum hydrocarbon (EPH) and target polycyclic aromatic hydrocarbon (PAH) groundwater sampling performed during the reporting period at AOC 69W in Section 3.3.1. Page 12, Section 3.4, Conclusions in the Report indicates that EPH results have been less than monitoring criteria at AOC 69W since the Fall 2019 LTM event.	Text summarizing the results for EPH and PAH analyses has been added to the section per the comment. EPH and PAHs were not detected in the fall 2022 groundwater samples.
2.	Page 15, Sec. 4.5	MassDEP recommends including text in Section 4.5 describing the results of the volatile petroleum hydrocarbon (VPH) and target volatile organic compounds (VOCs) groundwater sampling performed during the reporting period at AOC 43G in Section 4.5.	Text summarizing the results for VPH and target VOC analyses has been added to the section per the comment.
Michael Daly (USEPA)			
3.	N/A	EPA has no comments on the Draft 2022 Annual Operations, Maintenance, and Monitoring Report for Main Post.	N/A
END OF COMMENTS			