FINAL

Site Inspection Report for Gould Island

DERP FUDS Project Number: **D01RI033803**

Prepared Under: **Contract No. W912DY-04-D-0017**
Task Order No. 00170001

Prepared for:

U.S. Army Engineering and Support Center, Huntsville
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Huntsville, Alabama 35807

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August 2009

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August 2009

CONTRACTOR STATEMENT OF AUTHORSHIP AND INDEPENDENT TECHNICAL REVIEW

Alion Science and Technology Corporation has prepared this Site Inspection Report for the Gould Island, Formerly Used Defense Site (FUDS), Project No. D01RI033803. An independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project, as defined in the Programmatic Work Plan. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of assumptions; methods, procedures, and material used in analyses; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with existing Corps policy. In accordance with Corps requirements, significant authors to this report are presented below.

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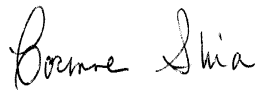
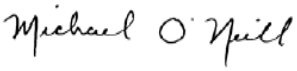
Corinne Shia Deputy Program Manager Alion Science and Technology Corporation	8/17/2009	
Michael O'Neill Project Manager EA Engineering, Science, and Technology, Inc. (Under contract to Alion Science and Technology Corporation)	8/17/2009	
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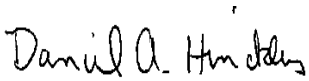
Daniel Hinckley, Ph.D. Risk Assessor EA Engineering, Science, and Technology, Inc. (Under contract to Alion Science and Technology Corporation)	8/17/2009	
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Significant concerns and explanation of the resolutions are documented within the project file.

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS AND ABBREVIATIONS

ADR	Automated Data Review
Alion	Alion Science and Technology Corporation
APFO	Aerial Photography Field Office
AN	Standardized for use by Army and Navy
ASR	Archive Search Report
BA	Bunker Area (Sampling Designation)
bgs	Below ground surface
CAS	Chemical Abstracts Service
CDQAR	Chemical Data Quality Assessment Report
CENAB	Corps of Engineers North Atlantic Baltimore
CENAE	Corps of Engineers North Atlantic New England
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COPC	Chemicals of Potential Concern
COPEC	Chemicals of Potential Ecological Concern
CQAR	Chemical Quality Assessment Report
CS	Conformation Study
CSM	Conceptual Site Model
CTT	Closed Transferring and Transferred
CWM	Chemical Warfare Materiel
DA	Disposal Area (Sampling Designation)
DERP	Defense Environmental Restoration Program
DMM	Discarded Military Munitions
DNT	Dinitrotoluene
DA	Department of the Army
DoD	Department of Defense
DQI	Data Quality Indicator
DQO	Data Quality Objective
EA	EA Engineering, Science, and Technology Inc.
Eco-SSL	Ecological Soil Screening Level
EDMS	Electronic Document Management Systems
EDS	Environmental Data Services, Inc.
EM	Engineering Manual
EOD	Explosive Ordnance Disposal
EP	Engineering Pamphlet
EPA	U.S. Environmental Protection Agency
ER	Engineer Regulation
ES	Executive Summary
˚F	Degree (s) Fahrenheit

LIST OF ACRONYMS AND ABBREVIATIONS

FSA	Farm Service Agency
ft	Foot or Feet
FUDS	Formerly Used Defense Site(s)
GM	Gun Mounts (Sampling Designation)
GPL	GPL Laboratories, LLLP
GI	Gould Island
GSA	General Services Administration
GW	Groundwater Sample
HE	High Explosive
HHE	Health Hazard Evaluation
HHRA	Human Health Risk Assessment
HMX	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
HRS	Hazard Ranking System
HTRW	Hazardous Toxic and Radiological Waste
HQ	Hazard Quotient
IAS	Initial Assessment Study
ID	Identification
in.	Inch(es)
INPR	Inventory Project Report
lb	Pound
LLLP	Limited Liability Limited Partnership
MC	Munitions Constituents
MD	Munitions Debris
MDL	Method Detection Limit
MEC	Munitions and Explosives of Concern
mg/kg	Milligram per kilogram
Mk	Mark
Mi	Mile(s)
MIT	Massachusetts Institute of Technology
MMRP	Military Munitions Response Program
Mph	Miles per hour
MPPEH	Material Potentially Presenting an Explosive Hazard
MRS	Munitions Response Site
MRSPP	Munitions Response Site Prioritization Protocol
MS	Magazine Ignitor Storage Area (Sampling Designation)
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NA	Not Available
NAD	North American Datum

LIST OF ACRONYMS AND ABBREVIATIONS

NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NCGC	National Cartography and Geospatial Center
NDAI	No Department of Defense Action Indicated
NG	Nitroglycerin
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NSL	No Screening Level
NTCRA	Non-Time Critical Removal Action
NUT	Essential Nutrient
NWI	National Wetlands Inventory
OEW	Ordnance and Explosive Waste
PAH	Polycyclic Aromatic Hydrocarbons
PAOI	Potential Area of Interest
PCB	Polychlorinated Biphenyls
PETN	Pentaerythritol tetranitrate
PM	Project Manger
PWS	Performance Work Statement
QA	Quality Assurances
QC	Quality Control
QR	Qualitative Reconnaissance
QSM	Quality Systems Manual
RAC	Risk Assessment Code
RDX	Hexahydro-1,3,5-trinitro-1,3,5-triazine
RI/FS	Remedial Investigation /Feasibility Study
RIDEM	Rhode Island Department of Environmental Management
RIGIS	Rhode Island Geographic Information System
RL	Reporting Limit
RMIS	Restoration Management Information System
SB	Subsurface Soil Sample
SD	Sediment Sample
SI	Site Inspection
SL	Screening Level
SLERA	Screening Level Ecological Risk Assessment
SS	Surface Soil Sample
SSL	Soil Screening Level
SS-WP	Final Site-Specific Work Plan Addendum to the MMRP Programmatic Work Plan for the Site Inspection of Gould Island
SVOC	Semi Volatile Organic Compounds

LIST OF ACRONYMS AND ABBREVIATIONS

T&E	Threatened and Endangered
TCRA	Time Critical Removal Action
Tetryl	Methyl-2,4,6-trinitrophenylnitramine
TNT	Trinitrotoluene
TPH	Total Petroleum Hydrocarbons
TPP	Technical Project Planning
TS	Torpedo Storehouse
USACE	U.S. Army Corps of Engineers
USAESCH	U.S. Army Engineering and Support Center, Huntsville
USC	United States Code
USDA	United States Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
UXO	Unexploded Ordnance

GLOSSARY OF TERMS

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) – Congress enacted CERCLA, commonly known as Superfund, on 11 December 1980. This law created a tax on the chemical and petroleum industries and provided broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment (USACE 2004b).

Discarded Military Munitions (DMM) – Military munitions that were abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include unexploded ordnance, military munitions that are being held for future use or planned disposal, or military munitions that were properly disposed of, consistent with applicable environmental laws and regulations. (10 USC 2710(e)(2)) (Department of the Army [DA] 2005).

Explosive Ordnance Disposal (EOD) – The detection, identification, on-site evaluation, rendering safe, recovery, and final disposal of unexploded explosive ordnance and of other munitions that have become an imposing danger, for example, by damage or deterioration (DA 2005).

Explosives Safety – A condition where operational capability and readiness, people, property, and the environment are protected from the unacceptable effects or risks of potential mishaps involving military munitions (DA 2005).

Formerly Used Defense Site (FUDS) – A FUDS is defined as a facility or site (property) that was under the jurisdiction of the Secretary of Defense and owned by, leased to, or otherwise possessed by the United States at the time of actions leading to contamination by hazardous substances. By the Department of Defense Environmental Restoration Program (DERP) policy, the FUDS program is limited to those real properties that were transferred from DoD control prior to 17 October 1986. FUDS properties can be located within the 50 States, District of Columbia, Territories, Commonwealths, and possessions of the United States. ER 200-3-1 (May 10, 2004) (USACE 2004b).

Material Potentially Presenting an Explosive Hazard (MPPEH) – Material potentially containing explosives or munitions (e.g., munitions containers and packaging material; munitions debris remaining after munitions use, demilitarization, or disposal; and range-related debris); or material potentially containing a high enough concentration of explosives such that the material presents an explosive hazard (e.g., equipment, drainage systems, holding tanks, piping, or ventilation ducts that were associated with munitions production, demilitarization or disposal operations). Excluded from MPPEH are munitions within DoD's established munitions management system and other hazardous items that may present explosion hazards (e.g., gasoline cans, compressed gas cylinders) that are not munitions and are not intended for use as munitions (DA 2005).

GLOSSARY OF TERMS

Military Munitions – All ammunition products and components produced for or used by the armed forces for national defense and security, including ammunition products or components under the control of the DoD, the Coast Guard, the Department of Energy, and the National Guard. The term includes confined gaseous, liquid, and solid propellants; explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives, and chemical warfare agents; chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges; and devices and components thereof. The term does not include wholly inert items; improvised explosive devices; and nuclear weapons, nuclear devices, and nuclear components, other than nonnuclear components of nuclear devices that are managed under the nuclear weapons program of the Department of Energy after all required sanitization operations under the Atomic Energy Act of 1954 (42 USC 2011 et seq.) were completed. (10 USC 101(e)(4)(A) through (C)) (DA 2005).

Munitions and Explosives of Concern (MEC) – This term, which distinguishes specific categories of military munitions that may pose unique explosives safety risks means: (A) Unexploded ordnance (UXO), as defined in 10 USC 101(e)(5); (B) DMM, as defined in 10 USC 2710(e)(2); or (C) Munitions constituents (e.g., trinitrotoluene, hexahydro-1,3,5-trinitro-1,3,5-triazine), as defined in 10 USC 2710(e)(3), present in high enough concentrations to pose an explosive hazard (DA 2005).

Munitions Constituents (MC) – Any materials originating from UXO, DMM, or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions. (10 USC 2710(e)(3)) (DA 2005).

Munitions Debris (MD) – Remnants of munitions (e.g., fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization, or disposal (DA 2005).

Munitions Response Area – Any area on a defense site that is known or suspected to contain UXO, DMM, or MC. Examples include former ranges and munitions burial areas. A munitions response area is comprised of one or more munitions response sites (32 Code of Federal Regulations [CFR] 179.3).

Munitions Response Site (MRS) – A discrete location within a Munitions Response Area that is known to require a munitions response (32 CFR 179.3).

GLOSSARY OF TERMS

Munitions Response Site Prioritization Protocol (MRSPP) – The MRSPP was published as a rule on 5 October 2005. This rule implements the requirement established in Section 311(b) of the National Defense Authorization Act for Fiscal Year 2002 for the DoD to assign a relative priority for munitions responses to each location in the DoD's inventory of defense sites known or suspected of containing UXO, DMM, or MC. The DoD adopted the MRSPP under the authority of 10 USC 2710(b). Provisions of 10 USC 2710(b) require that the DoD assign to each defense site in the inventory a relative priority for response activities based on the overall conditions at each location and taking into consideration various factors related to safety and environmental hazards.

Non-Time Critical Removal Action (NTCRA) – Actions initiated in response to a release or threat of a release that poses a risk to human health or the environment where more than six months planning time is available (USACE 2007a).

Range – A designated land or water area that is set aside, managed, and used for range activities of the DoD. The term includes firing lines and positions, maneuver areas, firing lanes, test pads, detonation pads, impact areas, electronic scoring sites, buffer zones with restricted access and exclusionary areas. The term also includes airspace areas designated for military use in accordance with regulations and procedures prescribed by the Administrator of the Federal Aviation Administration. (10 USC 101(e)(1)(A) and (B)) (DA 2005).

Range Activities – Research, development, testing, and evaluation of military munitions, other ordnance, and weapons systems; and the training of members of the armed forces in the use and handling of military munitions, other ordnance, and weapons systems. (10 USC 101(e)(2)(A) and (B)) (DA 2005).

Range Related Debris – Debris, other than munitions debris, collected from operational ranges or from former ranges (e.g. target debris, military munitions packaging, and crating material).

Risk Assessment Code (RAC) – An expression of the risk associated with a hazard. The RAC combines the hazard severity and accident probability into a single Arabic number on a scale from 1 to 5, with 1 being the greatest risk and 5 the lowest risk. The RAC is used to prioritize response actions (USACE 2004b).

Time Critical Removal Action (TCRA) – Removal actions conducted to respond to an imminent danger posed by the release or threat of a release, where cleanup or stabilization actions must be initiated within 6 months to reduce risk to public health or the environment (USACE 2007b).

Unexploded Ordnance (UXO) – Military munitions that (A) were primed, fuzed, armed, or otherwise prepared for action; (B) were fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and (C) remain unexploded whether by malfunction, design, or any other cause (10 USC 101(e)(5)(A) through (C)) (DA 2005).

EXECUTIVE SUMMARY

ES.1 Under contract with the United States Army Corps of Engineers (USACE), Alion Science and Technology Corporation (Alion) prepared this Site Inspection (SI) Report to document SI activities and findings for the Gould Island Naval Torpedo Testing Facility (Gould Island) Formerly Used Defense Site (FUDS), Property No. D01RI0338, located in Narragansett Bay approximately three and a half miles east of Jamestown, Rhode Island. The Department of Defense (DoD) has established the Military Munitions Response Program (MMRP) under the Defense Environmental Restoration Program (DERP) to address potential munitions and explosives of concern (MEC) and munitions constituents (MC) remaining at FUDS. This SI is completed under MMRP Project No. D01RI033803 and addresses potential MMRP hazards remaining at the Gould Island FUDS.

ES.2 **Site Inspection Objectives and Scope**. The primary objective of the MMRP SI is to determine whether or not the FUDS project warrants further response action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The SI collects the minimum amount of information necessary to make this determination. The SI also (i) determines the potential need for a Time Critical Removal Action (TCRA); (ii) collects or develops additional data, as appropriate, for potential Hazard Ranking System (HRS) scoring by the United States Environmental Protection Agency (EPA); and (iii) collects data, as appropriate, to characterize the hazardous substance release for effective and rapid initiation of the remedial investigation/feasibility study (RI/FS). An additional objective of the SI is to collect the additional data necessary to evaluate munitions response sites (MRSs) using the Munitions Response Site Prioritization Protocol (MRSPP).

ES.3 The scope of the SI is restricted to the evaluation of the presence of MEC or MC related to historical use of the FUDS prior to property transfer. Potential releases of hazardous, toxic, or radioactive waste (HTRW) are not within the SI scope.

ES.4 **Gould Island**. The Gould Island FUDS was established in 1918 as a torpedo repair and storage facility for the Navy. By 1921, seaplanes were stationed at Gould Island to experiment with air dropped torpedoes. In addition to test firing of air drop torpedoes in the waters off Gould Island, torpedoes were also test fired from submarines and from a test firing barge located on the northern side of Gould Island. Test firing of torpedoes from the barge ceased when the test fire pier on the northern end of Gould Island became fully functional in 1943 During World War II, the facility expanded and facilities were constructed for proof-testing inert torpedoes. The Gould Island facility was responsible for overseeing the proof firing of up to 100 inert torpedoes per

day for the Navy during the time period ranging from 1 January 1939 to 1 June 1946. Buildings and structures constructed on the island included a pyrotechnic storage building, a magazine igniter storage building, two torpedo warhead storage bunkers, four gun mounts, a torpedo overhaul shop, and an inert torpedo test facility with a firing pier. At some point after 1941, the warhead storage bunkers were converted to a pistol range and a storage facility. By 1972, the Navy discontinued its use of approximately 39.15 acres fee and the area was reported as excess to the General Services Administration (GSA) in November of 1972. On 28 March 1975, a quitclaim deed was initiated and the Government transferred 16.9 acres fee to the State of Rhode Island. On 18 April 1989, the Government again initiated action by transferring an additional 22.25 acres fee to the State of Rhode Island. Currently the area is managed as a state wildlife refuge.

ES.5 **Technical Project Planning.** The SI approach was developed in concert with stakeholders through USACE's technical project planning (TPP) framework, which was applied at the initial TPP meeting on 18 April 2008. Stakeholders agreed to the SI approach, as presented and modified during the TPP meeting and finalized in the Site-Specific Work Plan (SS-WP). In summary, these agreements were to inspect the MRS and four potential areas of interest (PAOI) and complete multimedia sampling in accordance with the Data Quality Objectives (DQOs) and the Final SS-WP.

ES.6 USACE programmatic range documents identified one MRS at the Gould Island FUDS: MRS 1 – Disposal Area 14 (Restoration Management Information System [RMIS] Range Identification [ID] No. D01RI033803R01. Four PAOIs were identified at Gould Island during the TPP meeting by the stakeholders: PAOI 1 – Bunkers #11 and #12, PAOI 2 – Torpedo Storehouse, PAOI 3 – North and South Gun Mounts and PAOI 4 – Magazine Ignitor Storage Area. All MRS and PAOI boundaries are located within the land portions of Gould Island. Therefore, in accordance with stakeholder discussions and the Final SS-WP, no sampling was performed within the water areas surrounding Gould Island.

ES.7 **Qualitative Site Reconnaissance and Munitions and Explosives of Concern Assessment**. SI field activities were performed on 9 December 2008. A qualitative site reconnaissance, including analog geophysics and visual observations, of the FUDS was performed over approximately 1.83 acres of land. The field sampling approach included magnetometer-assisted reconnaissance following a meandering path in and around sampling locations to identify the presence/absence of MEC/munitions debris (MD) or other areas of interest (i.e. areas containing indications of munitions disposal) at the FUDS. During the reconnaissance and sampling activities, no additional PAOI's or MEC/MD was identified. MRS

1 (the former disposal area) was identified along the west coast of Gould Island. Field observations and historical information revealed that debris was pushed off an area of higher elevation creating a debris field which drops sharply about 15-20 feet (ft) to the beach. Some backfilling using suspect incinerator ash and soil was evident along the top side of the disposal area (eastern side of the disposal area) and large quantities of metal debris (i.e. engine blocks, iron pipe, scrap etc.) and concrete blocks covered much of the ground surface along the beach (western side). On the top side/eastern part of MRS 1, the samples were offset numerous times because of refusal (i.e. root mass, rock and wood debris) and the field team was unable to advance the auger beyond 18-20 inches (in.) below ground surface (bgs) in most instances. Groundwater could not be collected and only one subsurface soil sample was collected due to refusal in the subsurface along the beach. Specific subsurface anomalies could not be discerned given the presence of metal debris scattered throughout the surface of the beach and along the topside of the disposal area. No sampling was performed within the PAOIs in accordance with stakeholder discussions and the Final SS-WP since there was no visual evidence of MEC/MD in the PAOIs.

ES.8 A qualitative MEC screening level risk assessment was conducted based on the SI qualitative reconnaissance, as well as historical data documented in the Inventory Project Report (INPR), Archives Search Report (ASR), and the ASR Supplement. MD (in the form of the aft section of a torpedo) was found along the beach in MRS 1 among piles of metal debris during the 1995 ASR site visit. There have been no historical reports of any MEC/MD found within PAOIs 1-4. No MEC or MD was found during the 2008 SI activities within MRS 1 or the PAOIs. The potential risk posed by MEC, assessed through three risk factors (i.e., presence of MEC source, accessibility or pathway presence, and potential receptor contact), is low for MRS 1 and PAOIs 1-4 due to the absence of the MEC source (no previous MEC findings and a single MD discovery in MRS 1 only almost 15 years ago), site characteristics, (i.e., a stable environment with limited site access as the MRS and PAOIs are on an island overgrown with vegetation and only accessible by boat), and limited potential for and limited frequency for receptor exposure (the area is managed as a wildlife refuge).

ES.9 **Munitions Constituents Sampling and Risk Screening**. A total of three surface soil samples (two planned and one added) were collected between 16-20 in. bgs, one subsurface soil sample was collected at 4 ft bgs, and two sediment samples were collected between 0-2 in. bgs in MRS 1. Sediment samples were collected from moist soil within the tidal zone along the beach in the northern portion of MRS 1. The second subsurface soil sample and single groundwater sample originally proposed for collection in MRS 1 could not be collected due to conditions encountered in the field. Specifically, refusal (cobbles and disposal area debris) was encountered

at approximately 3-4 ft bgs. Additional attempts to auger into the subsurface were met with refusal at approximately 1 ft bgs also due to the presence of debris and cobbles. After notifying the Alion Program Manager, the second subsurface soil and groundwater sample was abandoned in accordance with the field decision criteria in the Final SS-WP. As noted above, one additional surface soil (GI-DA-SS-02-03) was collected. No sampling was conducted in the PAOIs in accordance with the field decision criteria documented in the Final SS-WP.

ES.10 A list of MC potentially associated with munitions used at the FUDS was developed and used to support analysis of results and the risk screening. The list of site-specific MC for MRS1 includes: Pentaerythritol tetranitrate (PETN), Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX), Methyl-2,4,6-trinitrophenylnitramine (Tetryl), nitroglycerin, nitrobenzene and Trinitrotoluene (TNT) (and their associated breakdown products to include 2,4-dinitrotoluene (DNT); 2,6-DNT; 1,3,5-trinitrobenzene; nitrotoluene; 2-amino-4,6-DNT; 4-amino-2,6-DNT). A Human Health Risk Assessment (HHRA) and Screening Level Ecological Risk Assessment (SLERA) analyses were performed on sample results from MRS 1. Analytical results indicated that the only detection of explosives related MC in soil samples at MRS 1 was nitroglycerin in one sample which was detected above the human health screening criterion. The surface soil pathway for human receptors is complete and nitroglycerin was designated as a COPC. In summary, one Chemical of Potential Concern (COPC) and no Chemicals of Potential Ecological Concern (COPEC)s were identified in any media sampled at MRS 1. MQOs for sensitivity were not met for nitroglycerin in subsurface soil and sediment with respect to the associated human health screening level, consequently contamination may be present in these media at concentrations above the aforementioned human health screening level and the subsurface soil and sediment pathways remain potentially complete. Nitroglycerin was not labeled as a COPEC in soil due to the absence of a ecological screening value. Furthermore, MQOs for sensitivity were not met for six explosives in sediments with regard to ecological screening levels; therefore, contamination may be present in sediment at concentrations above the aforementioned ecological screening levels and the pathway remains potentially complete.

ES.11 **Recommendations.** During this SI, the land portions of MRS 1, PAOI 1, PAOI 2, PAOI 3, and PAOI 4 were assessed. No water ranges were associated with any MRS or any PAOI. Historically, one inert item, classified as MD, was discovered in MRS 1 (1995). Given the findings to date (no MEC in any MRS or any of the PAOIs) and the limited use of the site (state wildlife refuge), the potential for an explosive safety risk was determined to be low for MRS 1 and all four PAOI's based on the evaluation of the potential presence of three elements: a source (presence or absence of MEC/MD), a receptor (person), and interaction (e.g., touching or picking up an item). One explosive was detected in surface soil above its human health screening

criterion, which warrants further investigation. Based on the findings and conclusions of the SI report, a No Department of Defense Action Indicated (NDAI) designation is recommended for PAOIs 1, 2, 3, and 4. An NDAI designation also is recommended under the FUDS MMRP for MRS 1. One finding of MD (1995) and one explosive was detected in surface soil above its human health screening criterion at MRS 1. The overall MEC risk is low based on absence of the MEC source (no previous MEC findings and a single MD discovery almost 15 years ago), site characteristics, (i.e., a stable environment with limited site access as the MRS is on an island only accessible by boat), and limited potential for and limited frequency for receptor exposure. USACE has an ongoing HTRW project which encompasses MRS 1. MC, to include explosives, will be addressed during the ongoing HTRW project. Furthermore, if MEC is found at the site during a later date (i.e. HTRW investigation or other investigations), then an MMRP project may be re-opened for this MRS. The boundary for MRS 1 (Disposal Area) presented in the ASR Supplement does not match the location of the debris field/disposal area as observed in the field and should be expanded/adjusted as necessary to encompass the entire disposal area. The ASR Supplement should be revised accordingly. A TCRA or a non-TCRA is not recommended at this FUDS (Table ES-1).

Table ES-1 Summary of Site Recommendations for Gould Island

(FUDS Project No. D01RI033803)

Gould Island	Recommendation	Basis for Recommendation	
		MEC	**MC**
MRS 1 – Disposal Area	NDAI Designation[1,2] TCRA/NTCRA not recommended	MEC Assessment: Low risk. One inert item (aft section of a torpedo) classified as MD was discovered during the 1995 ASR site visit. No MEC/MD identified during 2008 SI activities.	***Risk Screening Assessment:*** Nitroglycerin was identified as a COPC. No COPECs identified. ***Sediment*** – No explosives MC detected in any sample. ***Surface Soil*** – Nitroglycerin detected in one sample above human screening criteria and identified as a COPC. [3] ***Subsurface Soil*** – No explosives MC detected in any sample. [3] ***Groundwater –*** Refusal in the subsurface, no sample collected. ***Surface water*** – No sampling performed in accordance with stakeholder agreements and the final SSWP.
PAOI 1 – Bunker Area	NDAI Designation TCRA/NTCRA not recommended	MEC Assessment: Low risk No MEC/MD findings documented historically or during the SI.	***Risk Screening Assessment:*** No evidence of MEC/MD on the surface. No sampling performed in accordance with stakeholder agreements and the final SSWP.
PAOI 2 – Torpedo Storehouse	NDAI Designation TCRA/NTCRA not recommended	MEC Assessment: Low risk No MEC/MD findings documented historically or during the SI.	***Risk Screening Assessment:*** No evidence of MEC/MD on the surface. No sampling performed in accordance with stakeholder agreements and the final SSWP.
PAOI 3 – North and South Gun Mounts	NDAI Designation TCRA/NTCRA not recommended	MEC Assessment: Low risk No MEC/MD findings documented historically or during the SI.	***Risk Screening Assessment:*** No evidence of MEC/MD on the surface. No sampling performed in accordance with stakeholder agreements and the final SSWP.
PAOI 4 – Magazine Ignitor Storehouse	NDAI Designation TCRA/NTCRA not recommended	MEC Assessment: Low risk No MEC/MD findings documented historically or during the SI.	***Risk Screening Assessment:*** No evidence of MEC/MD on the surface. No sampling performed in accordance with stakeholder agreements and the final SSWP.

Table ES-1 Summary of Site Recommendations for Gould Island

(FUDS Project No. D01RI033803)

Gould Island	Recommendation	Basis for Recommendation	
		MEC	MC
[1] An NDAI designation is recommended for MRS 1 under the FUDS MMRP. USACE has an ongoing HTRW project which encompasses MRS 1. MC, to include explosives, will be addressed during the ongoing HTRW project. Furthermore, if MEC is found at the site during a later date (i.e. HTRW investigation or other investigations), then an MMRP project may be re-opened. [2] The boundary for MRS 1 (Disposal Area) presented in the ASR Supplement does not match the location of the debris field/disposal area as observed in the field and should be expanded/adjusted as necessary to encompass the entire disposal area. The ASR Supplement should be revised accordingly. [3] MQOs for sensitivity were not met for nitroglycerine in subsurface soil and sediment with respect to the associated human health screening level, consequently contamination may be present in these media at concentrations above the aforementioned human health screening level and the subsurface soil and sediment pathways remain potentially complete. Nitroglycerin was not labeled as a COPEC in soil due to the absence of a ecological screening value. Furthermore, MQOs for sensitivity were not met for six explosives in sediments with regard to ecological screening levels; therefore, contamination may be present in sediment at concentrations above the aforementioned ecological screening levels and the pathway remains potentially complete.			
COPEC-Chemical of Potential Ecological Concern COPC-Chemical of Potential Concern ES-Executive Summary FUDS-Formerly Used Defense Site(s) MC-Munitions Constituents MEC-Munitions and Explosives of Concern MD-Munitions Debris MRS-Munitions Response Site NDAI-No Department of Defense Action Indicated NTCRA-Non Time Critical Removal Action SI-Site Inspection SS-WP-Site-Specific Work Plan TCRA-Time Critical Removal Action			

1. INTRODUCTION

1.0.1 This report documents the findings of the Military Munitions Response Program (MMRP) Site Inspection (SI) performed at the Gould Island Naval Torpedo Testing Facility (Gould Island) Formerly Used Defense Site (FUDS), located in Narragansett Bay approximately three and a half miles east of Jamestown, Rhode Island with the MMRP Project No. D01RI033803. Alion Science and Technology Corporation (Alion), along with its subcontractors (EA Engineering, Science, and Technology Inc. [EA]; Environmental Data Services, Inc. [EDS]; and GPL Laboratories, LLLP [GPL]); prepared this report under contract to the United States Army Engineering and Support Center, Huntsville (USAESCH). The SI is performed in accordance with Contract No. W912DY-04-D-0017, Task Order 00170001 for FUDS in the Northeast Region of the Continental United States. USAESCH transferred management of the contract to the Corps of Engineers North Atlantic Baltimore District (CENAB). CENAB is working with the Corps of Engineers North Atlantic New England District (CENAE) and its contractor, Alion, on the completion of this project in accordance with the SI Performance Work Statement (PWS) (Appendix A).

1.0.2 The technical approach of this SI is based on the *Programmatic Work Plan for Formerly Used Defense Sites Military Munitions Response Program Site Inspections at Multiple Sites in the Northeast Region* (Alion 2005) and the *Final Site-Specific Work Plan* (SS-WP) *Addendum to the MMRP Programmatic Work Plan for the Site Inspection of Gould Island* (Alion 2008b).

1.1 Project Authorization

1.1.1 The Department of Defense (DoD) established the MMRP to address DoD sites suspected of containing munitions and explosives of concern (MEC) or munitions constituents (MC). Under the MMRP, the U.S. Army Corps of Engineers (USACE) is conducting environmental response activities at FUDS for the Army as DoD's Executive Agent for the FUDS program.

1.1.2 Pursuant to USACE's Engineer Regulation (ER) 200-3-1 (USACE 2004b) and the *Management Guidance for the Defense Environmental Response Program (DERP)* (Office of the Deputy Under Secretary of Defense [Installations and Environment], September 2001) (DoD 2001), USACE is conducting FUDS response activities in accordance with the DERP statute (10 United States Code [USC] 2701 et seq.), the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (42 USC Section 9620), Executive Orders 12580 and 13016, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 Code of Federal Regulations [CFR] Part 300). As such, USACE is conducting SIs, as

set forth in the NCP, to evaluate hazardous substance releases or threatened releases from eligible FUDS.

1.1.3 While not all MEC/MC constitute CERCLA hazardous substances, pollutants, or contaminants, the DERP statute provides DoD the authority to respond to releases of MEC/MC, and DoD policy states that such responses shall be conducted in accordance with CERCLA and the NCP.

1.2 Project Scope and Objectives

1.2.1 The primary objective of the MMRP SI is to determine whether or not the FUDS project warrants further response action under CERCLA. The SI collects the minimum amount of information necessary to make this determination. The SI also (i) determines the potential need for a removal action; (ii) collects or develops additional data, as appropriate, for potential Hazard Ranking System (HRS) scoring by the U.S. Environmental Protection Agency (EPA); and (iii) collects data, as appropriate, to characterize the hazardous substance release for effective and rapid initiation of the remedial investigation/feasibility study (RI/FS). An additional objective of the MMRP SI is to collect additional data necessary to evaluate munitions response sites (MRSs) using the Munitions Response Site Prioritization Protocol (MRSPP).

1.2.2 The scope of the SI is restricted to the evaluation of the presence of MEC or MC related to historical use of this FUDS prior to property transfer. The evaluation is performed through records review, qualitative site reconnaissance to assess MEC presence/absence, and sampling where MC might be expected based on the conceptual site model (CSM). Evaluation of potential releases of hazardous, toxic, and radioactive waste (HTRW) is not within the scope of this SI.

1.3 Project Location

1.3.1 The FUDS portion of Gould Island is comprised of approximately 39.15 acres of land located in Narragansett Bay approximately three and a half miles east of Jamestown, Rhode Island (Figures 2-1 and 2-2). The North American Datum (NAD) 1983 Universal Transverse Mercator (UTM) X and Y coordinates for the approximate center of the FUDS boundary are 304324 meters (Easting) and 4600529 meters (Northing), respectively. The Gould Island FUDS falls under the contract management jurisdiction of CENAB and the geographical management of CENAE for project management and interfacing with regulators and stakeholders.

1.4 Munitions Response Site Prioritization Protocol

1.4.1 This SI Report includes a draft MRSPP ranking for MRS 1 (Disposal Area) [Appendix K]. The MRSPP scoring will be updated on an annual basis, or when necessary, to incorporate new information, as appropriate.

2. SITE DESCRIPTION

2.1 Site Description and History

2.1.1 In 1918, the United States took over, by proclamation, a portion of Gould Island for the intention of placing a lighthouse in Narragansett Bay. Additionally, the Navy needed a portion of the island to test and repair torpedoes. The remainder of Gould Island was acquired in 1920, and several buildings were erected for torpedo and warhead storage, and housing for a detachment of Marines (USACE 1995). Storage of torpedoes and warheads reportedly commenced sometime after construction. In 1921, two seaplanes were assigned to Gould Island to experiment with air-dropped Mark (MK) VII-2 torpedoes. In addition to test firing of air drop torpedoes in the waters off Gould Island, torpedoes were also test fired from submarines and from a test firing barge located on the northern side of Gould Island. Test firing of torpedoes from the barge ceased when the test fire pier on the northern end of Gould Island became fully functional in 1943 (Rhode Island Historical Preservation & Heritage Commission. 1995). Two hangers and a concrete ramp were constructed at the southern end of the island to support the aircraft. Torpedo testing involved the use of inert torpedoes dropped from aircraft to test launching techniques and torpedo guidance systems (USACE 1995).

2.1.2 By the end of 1940, employment at the Naval Station which included the Gould Island FUDS had risen to 4,802 employees (up approximately 1,000 in one year). On 27 May 1941, following a state of emergency declared by President Roosevelt, the station went through a period of rapid growth with additional torpedo facilities being leased at Long Wharf, Newport, and Fall River (USACE 1995).

2.1.3 By 1941, buildings and structures on the FUDS included a pyrotechnic storage building, a magazine igniter storage building, two warhead storage bunkers, a torpedo overhaul shop, an inert torpedo test facility with a firing pier (USACE 1995). In late 1941, the Chief of Naval Operations, First Naval District denied the Navy's request for expansion of ammunition storage. The Navy reported that the newly occupied buildings on the north end of Gould Island would not permit compliance with safety requirements related to safety distances to store warheads on the island; therefore, all storage operations were transferred to Prudence Island. On an unknown date after 1941, the warheads were likely removed and Bunker 11 was subsequently converted to a Pistol Range for weapons qualifications for personnel stationed on the island. Bunker 12 was subsequently converted to a general storage bunker on an unknown date after 1941(USACE 1995). The two hangers and the concrete ramp located at the southern end of the island were used as a base for anti-submarine warfare during World War II.

2.1.4 In February 1942, Gould Island attained the capability to proof fire up to 100 inert torpedoes per day to test torpedo guidance systems. The Navy built four 1.1-in. quadruple gun mounts at Gould Island for defense purposes. In early April of 1942, the 207th Coast Artillery Regiment, a semi-mobile New York National Guard Anti-Aircraft Unit, began moving into Gould Island where they relieved the Navy gun crews. The 207th Coast Artillery remained in the area until relieved by the 701st Artillery Regiment (anti-aircraft) the following year in April 1943. In July 1944, the Navy dismantled the anti-aircraft guns (USACE 1995).

2.1.5 Neither the Archive Search Report (ASR) nor the ASR Supplement provides site history between the years 1944 and 1972 (USACE 1995 and 2004a).

2.1.6 By 1972, the Navy discontinued its use of approximately 39.15 acres fee and the area was reported as excess to the General Services Administration (GSA) in November of 1972. On 28 March 1975, a quitclaim deed was initiated and the Government transferred 16.9 acres fee to the State of Rhode Island. On 18 April 1989, the Government again initiated action by transferring an additional 22.25 acres fee to the State of Rhode Island. Currently, within the above mentioned acreage, there is one parcel of land that contains a right-of-way for a Coast Guard Beacon. The Navy owns and continues to use the remaining 16.9 acres on the northern end of the island (USACE 1995) (Figure 2-1).

2.1.7 As of 2008 the Navy still tested unarmed torpedoes propelled by compressed air or water. Instead of warheads, they carry instruments that measure their performance. The weapon is retrieved, brought back to the laboratory, and examined by removing the instrument package out of the torpedo (USACE 1995, Alion 2008a and 2008b).

2.2 Munitions Response Site Identification and Munitions Information

2.2.1 The ASR Supplement (originally titled Inventory Project Report [INPR] Supplement) defines the range/sub-ranges associated with the FUDS property and assigns a Risk Assessment Code (RAC) score to each area where historic munitions related activities occurred (USACE 2004a). One range or MRS was identified at the former Gould Island (Table 2-1). Munitions associated with the MRS were derived from the ASR and ASR Supplement and other USACE munitions data sources and are summarized in Table 2-2.

- The ASR Supplement identified one range at Gould Island referred to as: Disposal Area 14 (Restoration Management Information System [RIMS] Range Identification [ID] D01RI033803R01) which consists of 1 acre. As shown in Table 2-2, a RAC score of 4 (with a RAC Override: Low Priority) was assigned to the Disposal Area 14 (USACE 2004a).

2.2.2 Range layouts are shown on Figures 2-2 and 2-3.

2.3 Physical Setting

2.3.0.1 The following sections provide a physical description of the FUDS property with respect to relief, vegetation, and climate as well as local demographic and land uses.

2.3.1 Topography and Vegetation

2.3.1.1 The Gould Island FUDS is generally flat and heavily vegetated with flat and rocky beaches. Off shore areas surrounding the island in Narragansett Bay are under the control of the U.S. Navy. Water depths in the areas surrounding the shore exceed 25 feet (ft) (USACE 1995). The elevation on Gould Island ranges from approximately 0 to 20 ft above the mean low water level and the majority of the elevation gain is near the coastline (Tetra-Tech 2006). Generally, Gould Island is flat, with two hills located along the western side. Site topography is depicted in Figure 2-4.

2.3.1.2 Shrubs and herbaceous plants cover the majority of the Gould Island FUDS. Herbaceous species that are common on the island include birds foot trefoil, perennial rye grass, tall fescue, goldenrods, common ragweed, tansy, white sweet clover, spotted knapweed, and other unidentified grasses. Common vines and woody shrubs include bittersweet, multi-flora rose, autumn olive, honeysuckle, and bayberry. The area adjacent to the Navy property, which comprises the FUDS, includes a dense thicket of shrubs and vines dominated by autumn olive and honeysuckle overgrown by bittersweet, greenbrier, and multi-flora rose (Tetra-Tech 2006).

2.3.2 Climate

2.3.2.1 The proximity to Narragansett Bay and the Atlantic Ocean plays a significant role in the meteorological state of the FUDS. Temperature throughout the year averages 50 degrees Fahrenheit (˚F) with 70˚F average temperatures (80 ˚F average maximum daily temperature) occurring through the summer months with 30˚F average temperatures (20˚F average daily minimum temperature) occurring during the winter months. Measurable precipitation is evenly distributed throughout the year. Of the total precipitation reported at the FUDS, 45 percent falls

through the months of April through December. On average, thunderstorms occur 21 days a year with most occurring in the summer months. During the winter months, the ground is frequently covered with snow. Average seasonal snowfall totals 36 inches (in.). On average, 19 days have at least 1 in. of snow on the ground (USACE 1995).

2.3.3 Local Demographics

2.3.3.1 The State of Rhode Island and the U.S. Navy are current landowners of portions of Gould Island, which is located 3.5 miles east of Jamestown, Rhode Island. The FUDS is not occupied; however, a limited number of personnel are present in the area occupied by the Navy for security and testing during times of operation.

2.3.3.2 Gould Island is located in Narragansett Bay, approximately 3.5 miles east of the town of Jamestown, Newport County, Rhode Island (Figure 2-3). As of 2000 the population density of Newport County is 821 people per square mile (mi^2). The 2007 Census population estimate for Newport County is 83,007 people. The 2007 estimate of the number of occupied housing units in Washington County is 33,675 housing units (U.S. Census Bureau 2009).

2.3.3.3 As of 2000, the population for the Jamestown, Rhode Island which includes the FUDS was 5,622 with a population density of 580 persons per mi^2 and 2,359 occupied housing units (U.S. Census Bureau 2009). Current 2005-2007 population estimates were not available from the U.S. Census Bureau during the preparation of this SI. Based on a review of aerial photographs, there are at least 26 or more housing units within 2 miles of the MRS.

2.3.4 Current and Future Land Use

2.3.4.1 According to the ASR, a total of 69 buildings were located on the island when it was occupied by the Navy. The Navy controls nine buildings and 16.9 acres which is not FUDS eligible. The Navy provides security over this area and conducts limited operations in this area. The Navy confirmed that there are periodic patrols of Gould Island by the Navy; however, this surveillance does not occur on a regular basis. Additionally, RIDEM has to coordinate with the Navy if visits to the northern portion of the island, which is owned by the Navy (FUDS ineligible portion), are planned. RIDEM does not have to coordinate with the Navy if visiting the southern (FUDS eligible) portion of the island. Lastly, the Navy stated that trespassers and fishermen have access to the entire island and the public visits the island without the Navy's knowledge. Communications regarding surveillance can be found in Appendix C of this SI report.

2.3.4.2 The FUDS, which consists of the remaining 39.15 acres, is owned by the State of Rhode Island and managed by the Rhode Island Department of Environmental Management (RIDEM) Department of Natural Resources (DNR). Approximately 60 buildings were transferred with the FUDS. These buildings are located on the southern end of the island, and some of these buildings have reportedly deteriorated to a hazardous condition. Some buildings also were destroyed by Hurricane Bob (USACE 1995). Roads within the site are covered with vegetation which limits access within the island (Tetra-Tech 2006 and Appendix D of this SI). The FUDS is currently used as a wildlife refuge; no personnel typically occupy the FUDS on a regular basis and public access is limited due to the nature of the FUDS (island which is covered with thick vegetation).

2.3.5 Geologic Setting

2.3.5.1 Rhode Island was covered by glacial ice sheets several thousand feet thick during the Pleistocene epoch, which began 2.5-3 million years ago. As the glacier moved south, it scoured and picked up older glacial deposits, bedrock, and soil. The final deposition of glacial material occurred during the Wisconsin glaciation approximately10,000-12,000 years ago. As the glacier melted and receded, it deposited unconsolidated material consisting mainly of unsorted glacial till and beds of meltwater sorted sand, gravel, and silt. The meltwater and eroded material the glacier carried caused a landscape of kames, eskers, terraces, and fluvial deposits (USACE 1995).

2.3.5.2 Gould Island lies within the Narragansett till plain and is covered by glacial till derived from sedimentary rock, shale, sandstone, conglomerate, and coal. The till generally is compacted, dark gray to olive colored, and finer textured than the fill derived from granite rock. The area has few bedrock out crops, and most of the landforms are drumloidal and have been smoothed by glacial action (USACE 1995).

2.3.5.3 The bedrock formations of Rhode Island are in four main groups. Not included in these four groups are a few trap dikes and quartz veins. From oldest to youngest, the groups are as follows: the Blackstone series of metamorphic (recrystallized) rock located along the Blackstone Valley and chiefly in the western area of the state, older granite rock of considerable variety and possibility of several ages, Pennsylvanian (coal-age) sedimentary rock of the Narragansett Basin in eastern Rhode Island, and younger granite rock that is exposed at Narragansett and which extends west to Westerly, Rhode Island (USACE 1995).

2.3.5.4 Most of the soil at Gould Island is Newport silt loam with an 8-15 percent slope. This sloping, well drained soil is located on the side slopes of drumlins and glacial till plains.

Typically, the surface layer is very dark brown silt loam 8 in. thick. The subsoil is olive brown and olive silt loam 16 in. thick. The substratum is olive gray chancery silt loam to a depth of 60 in. or more. The permeability of this soil is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in substratum. Available water capacity is moderate and runoff is rapid (USACE 1995).

2.3.5.5 The majority of the Gould Island shoreline is rocky with little to no sand beaches and displays cobble and some small sandy areas that are exposed during low tide. They are unprotected from the ocean and are subject to severe erosion during storms. The slopes range from 0 to 8 percent (USACE 1995).

2.3.6 Hydrogeologic Setting

2.3.6.1 There are no streams or drainage ditches on Gould Island. Drainage is by surface runoff into Narragansett Bay (USACE 1995). Tidal fluctuations at Gould Island vary. Mean high tide ranges from 3 to 3.8 ft, while mean low tide is approximately 0.1 ft (NOAA 2008). The shoreline consists of mainly manmade materials which consist of concrete slabs, steel and wooden pilings, and building rubble. A small sandy beach is present at the southern point of the island. Surface water runoff at Gould Island typically flows from the southwest to the northeast across the island and either evaporates, infiltrates surface soils or flows into Narragansett Bay (Tetra-Tech 2006).

2.3.6.2 Groundwater at the FUDS is tidally influenced with measurable differences of the water table observed within monitoring wells installed on Gould Island (Tetra-Tech 2006).

2.3.7 Area Water Supply/Groundwater Use

2.3.7.1 Four groundwater wells were installed at depths over 200 ft. It was determined that these wells could not produce adequate water supply demanded by the Navy for industrial purposes and eventually, a mixture of fresh and salt water was pumped to Gould Island from Aquidneck Island presumably from the municipal water supply (Tetra-Tech 2006). Currently, within the FUDS eligible portion of Gould Island, there are no potable drinking water wells. Visitors must transport their water to the island. The FUDS is surrounded by Narragansett Bay and there are no potable wells or well head protection areas within a ½ to ¾ of a mile from the Gould Island FUDS (Figure 2-5).

2.3.8 Sensitive Environments

2.3.8.0.1 The following subsections discuss the sensitive environments associated with the FUDS and the process used to determine the necessity for completing an ecological risk assessment at the FUDS.

2.3.8.1 Army Checklist for Important Ecological Places

2.3.8.1.1 In accordance with USACE HTRW Center of Expertise guidance, the Army Checklist for Important Ecological Places (USACE 2006 and 2007a) is completed (Table 2-3) to determine if a FUDS requires a screening-level ecological risk assessment).

2.3.8.1.2 The ASR notes that state T&E species historically have been known to populate the site (USACE 1995). USACE and Alion contacted the U.S. Fish and Wildlife Service (USFWS), Rhode Island Natural Heritage Program, and National Marine Fisheries Service (NMFS) Northeast Region to verify and update the status of T&E species on the FUDS. A response provided from USFWS indicates that there are no Federal T&E species or endangered habitat under the jurisdiction of the USFWS in the project area (USFWS 2008b). The RIDEM Division of Fish and Wildlife reported that there are no federally listed species present on Gould Island. However, RIDEM did state that a small heronry exists in the southwest corner of the island and a large gull colony exists on the exposed flat of the former torpedo facility. RIDEM also indicated that these areas may be used for breeding, but that the timing of the sampling event would not affect any biological species (RIDEM 2008). Based on a review of the RIDEM website, it was noted that Gould Island is designated a "Natural Heritage Area for Rare Species" **(**RIDEM 2009) and the site is also used as a state wildlife refuge. NMFS identified essential fish habitat in the vicinity of the FUDS. NMFS responded that the proposed sampling will have no effect on National Oceanic and Atmospheric Administration (NOAA) trust resources and that further consultation with NMFS is not required (NOAA 2008). Threatened and endangered species consultation responses from the USFWS, RIDEM and the NMFS Northeast Region are included in Appendix L.

2.3.8.2 Wetlands

2.3.8.2.1 The State of Rhode Island maintains Gould Island as a wetland habitat because the area is suited for wetland wildlife species which thrive in saltwater (USACE 1995). No wetlands vegetation disturbance or clearance was required during field sampling activities; therefore, no impacts to wetlands occurred.

2.3.8.3 Coastal Zones

2.3.8.3.1 The FUDS is situated within the Rhode Island Coastal Zone (Rhode Island Coastal Resources Management Council, 2009). This area is managed under the Rhode Island Coastal Management Program, which is administered by the Rhode Island state government through the Coastal Resources Management Council. The SI activities included only surface soil, subsurface soil, and sediment sample collection (groundwater was unable to be collected). Sampling activities did not disturb the coastal areas. Although Gould Island is totally surrounded by water, as per agreement at the 2008 TPP meeting, no sampling or qualitative reconnaissance was conducted in the waters surrounding the Gould Island FUDS (Alion 2008a and 2008b).

2.4 Previous Investigations for Munitions Constituents and Munitions and Explosives of Concern

2.4.0.1 A summary of pertinent historical investigations at Gould Island is provided in the following subsections. Chemical Warfare Materiel (CWM) was not used or stored at the former Gould Island (USACE 1995).

2.4.1 1986 Gould Island Confirmation Study (CS)

2.4.1.1 The Confirmation Study[1] (CS) study involved the collection of sediment and mussel samples near the shoreline of the disposal area, which were analyzed for polychlorinated biphenyls (PCBs) and heavy metals. High concentrations of lead and copper (310 and 292 milligrams per kilogram [mg/kg] respectively) were reported in near-shore sediment samples. Control samples were collected from Narragansett Bay in areas considered uncontaminated. Concentrations measuring 27.5 mg/kg lead and 18.3 mg/kg copper were observed in control areas. Chromium (17.8 mg/kg) and nickel (29.3 mg/kg) were also detected in near-shore sediments in the vicinity of the disposal area at concentrations slightly higher than maximum concentrations detected in control samples (chromium at 11.5 mg/kg and nickel at 21.3 mg/kg). Copper, detected at 17.5 mg/kg, was the only heavy metal detected in mussel samples at concentrations higher than the control sample, which contained copper at a concentration of 7.2 mg/kg. No PCBs were detected in either the sediment or the mussel samples analyzed. The off-shore sediment samples contained concentrations comparable to concentrations in sediment at control stations, located near-shore to the north and south of the disposal area. The near-shore sediment test results indicated elevated concentrations of lead and copper and slightly elevated

[1] The CS study, which was completed by Loureiro Engineering Associate and York Wastewater Consultants in 1986, was not formally reviewed by the Alion Team. Information pertaining to this document was obtained from the conclusions presented in the 1997 Final Interim Report by Stone & Webster.

concentrations of chromium and nickel compared to the control samples. Lead was detected in mussels at concentrations up to four times that found in the control samples in the CS. Copper, chromium and nickel were detected at concentrations comparable to the control samples (Stone & Webster 1997).

2.4.2 1992 Inventory Project Report

2.4.2.1 CENAE prepared an INPR for the former Gould Island Naval Torpedo Testing Facility. The INPR concluded that the Gould Island facility located in Jamestown, Rhode Island had been used by the Department of the Navy and there were eligible categories of hazards requiring further action under the DERP-FUDS program. An ordnance and explosive waste[2] (OEW) project was recommended for Gould Island (USACE 1992). The INPR reported that sediment sampling was conducted at the FUDS in a former disposal area (identified as Disposal Area 14). Elevated levels of lead, copper, chromium, and nickel were reported in the sediment samples. The INPR noted the presence of approximately 30 drums in and around Disposal Area 14 and Bunker 11. An HTRW project (RI/FS) was proposed to determine the extent of the contamination.

2.4.3 1995 Archive Search Report

2.4.3.1 In 1995, USACE Rock Island District completed an ASR for the Gould Island FUDS. Personnel from the USACE Rock Island District conducted a site visit at the former Gould Island Naval Torpedo Testing Facility on 18 October 1994. The ASR field team confirmed the eligibility of 39.15 acres and identified seven areas which required investigation for the presence of UXO. One area (termed Area A) was determined to be on the active part of the site used by the Navy and was identified as not being part of the FUDS. The ASR field team did not identify any UXO within any of the seven areas (USACE 1995). Observations pertaining to each of the areas are presented below:

- Area A – Naval Torpedo Testing Facility (16.9 acres) – Area A is located on the northern end of the island. The Naval Torpedo firing pier and the torpedo overhaul shop (Building 32) were located in this area. This area is under control/occupation by DoD, therefore, this area is ineligible under DERP-FUDS (USACE 1995).

[2] The project category dealing with military munitions hazards termed OEW and defined under DERP-FUDS as ordnance and explosive waste, has been replaced with MMRP.

- Area B – Bunkers 11 and 12 (0.5 acres) [*PAOI 1*][3] – Area B is located in the southeast section of the island and currently is owned by the state of Rhode Island. These buildings originally were used for the storage of ordnance including torpedo warheads. After the beginning of World War II, Bunker 11 was converted to a pistol range and Bunker 12 was converted to a storehouse. During the ASR site visit, there was evidence of general storage as empty barrels marked "soap" and large amounts of lumber from the bunker itself were observed. Both bunkers had deteriorated to a hazardous level making entry almost impossible. No MEC/MD was observed in this area. The ASR noted that torpedo warheads were a highly classified controlled inventory item and that there was no chance of the U.S. Navy leaving a 326-pound (lb) warhead behind when they ceased warhead storage on the island (USACE 1995).

- Area C – Disposal Area 14 (0.5 acres) [*MRS 1*] – Located on the western side of the island, Area C is owned currently by the State of Rhode Island. During the timeframe of the ASR, an HTRW investigation was ongoing[4]. It was stated that the site could only be reached by way of the beach from the south end of Gould Island from the aircraft ramp. The disposal area is located at the base of a 25-ft cliff and is the main dumpsite for the island. This area contained large amounts of trash to include sheets of steel (reduced to red powder), rusty pipes, engine blocks, washing machine parts, weapon cradles, concrete mooring anchors, bricks, cleats, iron, tiles, and an aft section of a torpedo. Normal entry to the location is impossible as the roads are covered with heavy brush, overgrown trees, rose thickets and poison ivy vines (USACE 1995).

- Area D – Magazine/Ignitor Storage Area (approx 0.1 acres) [*PAOI 4*] – During the ASR site visit, the inspection team could not access this part of the island as the western section of the island was impossible to enter without the aid of mechanical clearing equipment. The area was covered with heavy brush, rose thickets, and poison ivy (USACE 1995).

- Area E – Four Gun Mounts (approx 2 acres) [*PAOI 3*] – The gun mounts are located in the same general location as Area D. At the time of the ASR site visit, the area was

[3] Four areas were designated Potential Areas of Interest (PAOI) as a result of discussions with RIDEM. Refer to Section 2.4.7 for further discussions.

[4] The ASR and ASR Supplement both stated that an HTRW "Removal Action" was ongoing. However, upon review of the 1997 Stone and Webster report, it was determined that an HTRW investigation, not a removal action, was ongoing. No evidence of a removal action occurring at the site has been found. Refer to Section 2.4.4 for a summary of the 1997 Stone & Webster report.

covered by heavy brush, rose thickets, and poison ivy. Entry to the gun mount sites was not possible without the aid of mechanized clearing equipment. From the vantage point of the field team, no MEC/MD was present at this location (USACE 1995).

- Area F – Torpedo Store House (approximately 0.5 acres) [*PAOI 2*] – Area F is located on the southern section of the island in Building 10. This facility stored torpedoes during World War I and was then transformed to inert storage. The ASR noted that this building only stored torpedoes (without warheads). The warheads, the explosive part of a torpedo, were stored in Area B. During the site visit, empty wooden boxes which contained electrical equipment and other non-ordnance related material were observed along with empty soda cans and other litter. Vandalism was indicated by broken windows and smashed porcelain fixtures. Open manholes were noted to pose a threat to visitors. There was no visible indication of MEC/MD in this area (USACE 1995).

- Area G – Ordnance Test Facility / Hangar and Pyrotechnic Storage Building (approximately 0.5 acres) – This location was destroyed by Hurricane Bob and the only features which remain are building foundations and a concrete sea plane ramp. This location was used to carry out testing of Mk VII-2 torpedoes. No visible evidence of MEC/MD was located at this area by the field team (USACE 1995).

2.4.4 1997 Engineering Evaluation of Contamination, Former Naval Torpedo Testing Facility

2.4.4.1 In 1997, Stone and Webster, under contract to the Army, prepared a Final Interim Report of contamination at various sites (underground storage tanks, transformer sites, coal storage sites, disposal area, bunkers, and drum/container sites) at Gould Island.[5] Prior to field activities, historical reports including an Initial Assessment Study (IAS)(Envirodyne Engineers, Inc. 1983), the CS (Loureiro Engineering Associates and York Wastewater Consultants 1986), and the INPR (USACE 1992) were reviewed by Stone and Webster.

2.4.4.2 The contamination report indicated that Disposal Area 14, the area of interest in this SI, may have received incinerator ash, domestic waste, building rubble, rusted drums and, possibly, waste from the electroplating and degreasing operations. Wastes from these operations reportedly included muriatic acid, chromic acid, copper cyanide, sodium cyanide, sodium hydroxide, nickel sulfate and Anodex cleaner. Approximately twenty drums were reported to

[5] This report was completed under an ongoing HTRW project D01RI033802 (formerly referred to as D01RI033800 in other documentation).

have been present at this site at the time the INPR was prepared, all of which appeared to be empty and rusted. As reported by Stone and Webster the IAS identified a concern that waste comes into contact with the water along the shore at high tide, and drainage and leachate seep directly into the Bay. The IAS stated that contamination could adversely affect shellfish and finfish (biota), and stated that a confirmation study should be performed (Loureiro Engineering Associates and York Wastewater Consultants 1986 and Stone & Webster 1997).

2.4.4.3 None of the above-referenced studies characterized the contents of Disposal Area 14 (MRS 1). Field work was performed by Stone and Webster during October and December 1994 and conclusions were drawn about various sites including Underground Storage Tank sites, Transformer sites, Coal Storage sites, Disposal Area 14, Bunker Sites and an old Drum Site. In regards to Disposal Area 14, the field team detected Semi-Volatile Organic Compounds (SVOCs) and Total Petroleum Hydrocarbon (TPH) within soil samples at the site which may be attributable to coal ash, incinerator ash or petroleum which may have been dumped at the site. It was also stated that the SVOCs and TPH could also be attributable to past controlled burning by the state for management of the area. Lead, arsenic, and low levels of a pesticide (4-4'-DDT) also were detected. Recommendations for this area included additional surface soil samples being collected from underneath drums and from the ocean-side face of the disposal area for analysis to provide data for use in risk assessment. Additionally, the report recommended that potential sources of contamination should be characterized by excavating test pits perpendicular to its north-south trending axis and by collecting soil, debris, and water samples (Stone & Webster 1997).

2.4.5 2004 Archive Search Report Supplement

2.4.5.1 In 2004, the USACE Rock Island District prepared an ASR Supplement for Gould Island. The ASR Supplement assessed the range acreage, identified munitions used, and assigned a RAC score for each range. The ASR Supplement identified one range at Gould Island referred to as: Disposal Area 14 (RMIS Range ID D01RI033803R01) which consists of 1 acre. As shown in Table 2-2, a RAC score of 4 (with a RAC Override: Low Priority) was assigned to the Disposal Area 14 (USACE 2004a). [6]

[6] Risk Assessment Code (RAC)—An expression of the risk associated with a hazard. The RAC combines the munitions hazard severity and accident probability into a single Arabic number on a scale from 1 to 5, with 1 being the greatest and 5 the lowest. Prior to the current MMRP program guidance which utilizes MRSPP protocol, the RAC scoring was used to prioritize response actions (USACE 2004b).

2.4.6 2006 Remedial Investigation Report for Building 32

2.4.6.1 In 2006, Tetra-Tech, under contract of by the Department of the Navy, performed an RI at Building 32, located on the northern end of the island (the non-FUDS eligible portion of Gould Island). Between May and September 2005, RI field activities were performed at Building 32. During this time, various media were sampled, including surface soil, subsurface soil, groundwater, and sediment. Test pit samples and sludge samples (from manholes) were also collected. Samples were analyzed in accordance with RIDEM standards. The RI reported that samples contained detections of polycyclic aromatic hydrocarbons (PAH), PCBs, metals, and other compounds. No sampling was conducted on the FUDS (Tetra-Tech 2006).

2.4.7 PAOI Reconnaissance and Sampling Request

2.4.7.1 As documented in the Final SS-WP, a conference call was held on 7 November 2008 with USACE, RIDEM and the Alion Team to discuss RIDEM comments regarding the sampling planned for Gould Island, and specifically to discuss RIDEM's request for additional reconnaissance and sampling at other locations within the FUDS identified as PAOIs 1-4 (Alion 2008b). Alion agreed to designate the former warhead storage magazines as PAOI 1, the Torpedo Store House as PAOI 2, the former Gun Mounts as PAOI 3, and the former Magazine/Ignitor Storage Area as PAOI 4. Alion agreed to perform reconnaissance of these areas and collect a sample if MEC/MD were observed in these areas. If no evidence of MEC or MD is observed, no samples were to be collected in accordance with stakeholder agreements. Stakeholders agreed that no vegetative clearing would be performed consistent with other SIs and the environmental protection plan outlined in the Final SS-WP (Alion 2008b). Worker safety was also discussed given the hazardous condition of existing structures. In accordance with stakeholder agreements, the field team would not enter a structure if a safety hazard was observed during the site reconnaissance.

2.5 Citizen Reports of Munitions and Explosives of Concern

2.5.0.1 To date, no MD or MEC has been found on the FUDS by local citizen's (USACE 1995, Alion 2008a and 2008b).

2.6 Non-Department of Defense Contamination/Regulatory Status

2.6.0.1 There is no evidence, based on historical review and stakeholder comments, that activities occurring prior to or after DoD use of the area contributed to potential MEC, MD, or MC findings.

Table 2-1 Range Inventory (USACE 2004a)

Site Name	Range Name[1]	Subrange Name	RMIS Range Number	RAC Score	Acreage
Gould Island	Disposal Area 14 (MRS 1)	Not applicable	D01RI033803R01	4	1

MRS = Munitions Response Site

RMIS = Restoration Management Information System

RAC = Risk Assessment Code. Scores range from 1 to 5, with 1 being of the greatest concern.

1 – MRS designation completed by USACE.

Table 2-2 Munitions Types and Compositions (USACE 1995 and 2004a)

Range ID (MRS)	Munitions ID	Munitions Type	Composition (Filler, Projectile, Body, Propellant, other)	Associated MC Analysis[1]
Disposal Area 14 (MRS 1)	Flares, Signals, Simulators, or Screening Smoke (other than White Phosphorus) (CTT35)	M49A1 Surface Flare	Illuminating projectile compositions: Sodium nitrate, magnesium, and Laminac A (binding agent). Trip flare compositions: aluminum, 69.5% barium nitrate, 5% sodium oxalate, and 4% sulfur. 30.4% magnesium, 26.6% sodium nitrate, 11% strontium nitrate, calcium carbonate. Reconnaissance and Landing Flare Composition – The illuminate in these flares consists of the following components: aluminum, magnesium, barium nitrate, sodium oxalate, sulfur. Aircraft Flares - composed of aluminum, barium nitrate, strontium nitrate, sulfur and linseed oil.	Explosives: • Sodium nitrate (no analysis) Metals: • Aluminum (no analysis)[2] • Barium (no analysis)[2] • Magnesium (no analysis)[2] • Strontium (no analysis)[2] • Sulfur (no analysis)[2] Other: • Perchlorate (analysis in groundwater only)[3]
	Torpedoes/ SEA Mines (CTT47)	General Torpedo, Navy	643 lb Torpex[4]– RDX/TNT/Aluminum/Wax desensitizer (used on underwater munitions only) 746 lb Torpex[4] 95 lb Torpex[4] 585 lb Torpex[4]	Explosives: • RDX • HMX[4] • TNT Metals: • Aluminum[2]
	Medium Caliber (20MM, 25MM, 30MM), Practice (CTT17)	1.1-in. shell, HE MK 1 Mod 0-28/1.1-in. shell, HE MK SDI	*Projectile*: iron *Propellant*: Black Powder (Potassium Nitrate, Sulfur, and Charcoal), nitrocellulose, or Nitroglycerin, 2,4-DNT *Filler*: ammonium picrate	Explosives: • Nitroglycerin • 2,4-DNT • Ammonium Picrate (no analysis)[5] Metals: • Iron[2]
	Small Arms (CTT01)	0.45-caliber cartridge	*Projectile*: iron, lead, antimony, chromium, manganese, nickel, copper, and molybdenum. *Propellant*: Black Powder[6] (Potassium Nitrate, Sulfur, and Charcoal), nitrocellulose, or Nitroglycerin, 2,4-DNT *Filler*: Not applicable *Primer:* aluminum, antimony, barium, lead, and PETN	Explosives: • Nitroglycerin • 2,4-DNT • PETN Metals: • Antimony[2] • Chromium[2] • Copper[2] • Iron[2] • Lead[2] • Manganese[2]

Table 2-2 Munitions Types and Compositions (USACE 1995 and 2004a)

Range ID (MRS)	Munitions ID	Munitions Type	Composition (Filler, Projectile, Body, Propellant, other)	Associated MC Analysis[1]
			Tracer: barium, magnesium, potassium perchlorate, and strontium, zinc	• Nickel[2] Other: • Perchlorate (analysis in groundwater only)[1]
PAOIs 1 – Bunker Area (Warhead Storage Bunkers [Bunkers 11 and 12])	Torpedoes/ SEA Mines (CTT47)	General Torpedo, Navy	643 lb Torpex[4]– RDX/TNT/Aluminum/Wax desensitizer (used on underwater munitions only) 746 lb Torpex[4] 95 lb Torpex[4] 585 lb Torpex[4]	Explosives: • RDX • HMX[4] • TNT Metals: • Aluminum[2]
PAOI 2 – Torpedo Storehouse	Torpedoes/ SEA Mines (CTT47)	General Torpedo, Navy	643 lb Torpex[4]– RDX/TNT/Aluminum/Wax desensitizer (used on underwater munitions only) 746 lb Torpex[4] 95 lb Torpex[4] 585 lb Torpex[4]	Explosives: • RDX • HMX[4] • TNT Metals: • Aluminum[2]
PAOI 3- Gun mounts	Medium Caliber (20MM, 25MM, 30MM), Practice (CTT17)	1.1-in. shell, HE MK 1 Mod 0-28/1.1-in. shell, HE MK SDI	*Projectile*: iron *Propellant*: Black Powder (Potassium Nitrate, Sulfur, and Charcoal), nitrocellulose, or Nitroglycerin, 2,4-DNT *Filler*: ammonium picrate	Explosives: • Nitroglycerin • 2,4-DNT • Ammonium Picrate (no analysis)[5] Metals: Iron[2]
PAOI 4 – Magazine Ignitor Storage Area	Torpedoes/ SEA Mines (CTT47)	General Torpedo, Navy	643 lb Torpex[4]– RDX/TNT/Aluminum/Wax desensitizer (used on underwater munitions only) 746 lb Torpex[4] 95 lb Torpex[4] 585 lb Torpex[4]	Explosives: • RDX • HMX[4] • TNT Metals: • Aluminum[2]

AN= standardized for use by Army and Navy
CTT= Closed Transferring and Transferred
HE=High Explosive
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
HTRW = Hazardous Toxic and Radiological Waste
ID = Identification
Mk=Mark
MRS = Munitions Response Site
PAOI= Potential Area of Interest
PETN = Pentaerythrite Tetranitrate

1. Based on available technical manuals, MCs identified for site munitions include the following: **Primer** (potassium chlorate, lead thiocyanate, antimony sulfide, PETN, lead styphnate, barium nitrate, calcium silicade, acacia technical, acetylene black); **Tracer** (strontium nitrate, strontium peroxide, magnesium powder, calcium resinate, strontium oxalate, potassium perchlorate); **Incendiary mixtures** (barium nitrate, magnesium/aluminum powder, asphaltum, graphite). These materials when combined typically represent less than 5% of the weight of the material projectile for small and medium caliber munitions. Typical volumes are broken out as follows: Primer (less than 1% or 1 gram), Tracer (less than 1% or < 1 gram), Incendiary (less than 2% or < 2 grams) and fuze (less than 1% or < 1 gram). These materials along with the propellant typically burn as the projectile is fired. Therefore, the MC sampling/analysis typically focuses on primary constituents present in propellants and the projectile/casings in firing points and

Table 2-2 Munitions Types and Compositions (USACE 1995 and 2004a)

Range ID (MRS)	Munitions ID	Munitions Type	Composition (Filler, Projectile, Body, Propellant, other)	Associated MC Analysis[1]
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine TNT = Trinitrotoluene				

impact areas. Considering that MRS 1 was potentially used as a disposal area PETN is carried forward for analysis.

2. MRS 1 was used throughout World War II as a dump site for all wastes generated on the island. These wastes include incinerated ash, domestic waste, building rubble, rusted drums, and waste from electroplating and degreasing operations (such as muriatic acid, chromic acid, copper cyanide, sodium cyanide, sodium hydroxide, nickel sulfate, Anodix cleaner, and degreasing solvents). a significant amount of metal debris was visible on the surface during past site visits. Sediment testing in 1986 (USACE 1995) confirmed that near-shore sediments contain significantly high levels of lead and copper and slightly high chromium and nickel concentrations. An HTRW project was authorized to address metals and other contamination identified in the MRS; therefore, metals are not carried forward for analysis.
3. Perchlorate, although not listed as being present in the Flares, Signals, Simulators or Screening Smoke, is a constituent of Photoflash Composition and Pyrotechnic Signals Composition. Potassium perchlorate is present in various Photoflash Compositions used in pyrotechnic signals and ammonium perchlorate is present in compositions used in ground smoke signals. The source of perchlorate is expected to be from disposal of damaged ammunition containing perchlorate or demilitarization of small arms ammunition, primers, etc. Unlike other explosive compounds, perchlorate does not adsorb to soil easily and is not persistent in soil; i.e., it typically migrates downward through the soil to groundwater (DoD 2006a). A release of perchlorate to the groundwater could have occurred from munitions disposal or demilitarization on the FUDS. Given the high solubility and mobility of perchlorate, it is unlikely to be detected in soil after almost 60 years since the site was actively used. Due to the time that has passed since DOD use of the site and the active nature of the site (tidal flushing of waters) it is unlikely for perchlorate to be present in soils and groundwater at the FUDS. However, RIDEM requested an analysis of perchlorate, therefore, groundwater will be sampled and analyzed for this MC.
4. Torpex – 42% RDX; 40% TNT; 18% Aluminum/Wax desensitizer.
5. The source of ammonium picrate would be from disposal of damaged ammunition containing ammonium picrate. Once released to the environment, ammonium picrate rapidly degrades into picric acid (2,4,6-trinitrophenol). Picric acid is extremely soluble in water (13,000-14,000 mg/L, or approximately 1.3%; Mackay et al. 1995), and would be expected to rapidly move away from a point of release in a moving water situation (such as release into an estuary or other moving water body). The half-life of picric acid based on aqueous aerobic biodegradation ranges from 1 month to a year and from 2 days to 12 days based on anaerobic biodegradation (Mackay et al. 1995). In summary, picric acid, in most situations, has a moderate persistence (days to months), but is extremely soluble in water and would not favor sorption onto sediment. In an active aquatic environment, any released picric acid is expected to move with water column currents and rapidly dilute; therefore, it is unlikely for ammonium picrate to be present in soils or groundwater at the FUDS.
6. Black powder consists of varying concentrations of charcoal, sulfur, and either potassium nitrate or sodium nitrate (Department of the Army [DoA] 1984). The constituents of black powder are not expected to persist in the environment above background concentrations for a significant period of time after initial exposure. In addition, no analysis is performed for nitrocellulose (nitrated paper) and/or diphenylamine (a stabilizer).

Table 2-3 Army Checklist for Important Ecological Places

No.	Checklist Item	Yes	No[1]	Comments
1.	Locally important ecological place identified by the Integrated Natural Resource Management Plan, BRAC Cleanup Plan or Redevelopment Plan, or other official land management plans.		X	
2.	Critical habitat for Federal designated endangered or threatened species. See No. 12 below.		X	
3.	Marine Sanctuary		X	
4.	National Park		X	
5.	Designated Federal Wilderness Area		X	
6.	Areas identified under the Coastal Zone Management Act	X		The FUDS is situated within the Rhode Island Coastal Zone and managed under the Rhode Island Coastal Management Program, which is administered by the Rhode Island state government through the Coastal Resources Management Council (Rhode Island Coastal Resources Management Council, 2009).
7.	Sensitive Areas identified under the National Estuary Program or Near Coastal Waters Program		X	
8.	Critical areas identified under the Clean Lakes Program		X	
9.	National Monument		X	
10.	National Seashore Recreational Area		X	
11.	National Lakeshore Recreational Area		X	
12.	Habitat known to be used by Federal designated or proposed endangered or threatened species		X	
13.	National preserve		X	
14.	National or State Wildlife Refuge		X	
15.	Unit of Coastal Barrier Resources System		X	
16.	Coastal Barrier (undeveloped)		X	
17.	Federal land designated for protection of natural ecosystems		X	
18.	Administratively Proposed Federal Wilderness Area		X	
19.	Spawning areas critical for the maintenance of fish/shellfish species within river, lake, or coastal tidal waters	X		NOAA, NMFS identified essential fish habitat in the vicinity of the site (NOAA 2008).
20.	Migratory pathways and feeding areas critical for maintenance of anadromous fish species within river reaches or areas in lakes or coastal tidal waters in which fish spend extended periods of time		X	
21.	Terrestrial areas utilized for breeding by large or dense aggregations of animals	X		The RIDEM Division of Fish and Wildlife reported that there is a small heronry in the southwest corner of the island and a large

Table 2-3 Army Checklist for Important Ecological Places

No.	Checklist Item	Yes / No[1]		Comments
				gull colony on the exposed flat of the former torpedo facility (RIDEM 2008).
22.	National river reach designated as Recreational		X	
23.	Habitat known to be used by state designated endangered or threatened species		X	
24.	Habitat known to be used by species under review as to its Federal endangered or threatened status		X	
25.	Coastal Barrier (partially developed)		X	
26.	Federally designated Scenic or Wild River		X	
27.	State land designated for wildlife or game management		X	
28.	State-designated Scenic or Wild River		X	
29.	State-designated Natural Areas		X	
30.	Particular areas, relatively small in size, important to maintenance of unique biotic communities		X	
31.	State-designated areas for protection or maintenance of aquatic life		X	
32.	Wetlands	X		The State of Rhode Island maintains Gould Island as a wetland habitat because the area is suited for wetland wildlife species which thrive in saltwater (USACE 1995)
33.	Fragile landscapes, land sensitive to degradation if vegetative habitat or cover diminishes		X	

[1] One or more "Yes" responses indicates the need for a SLERA.

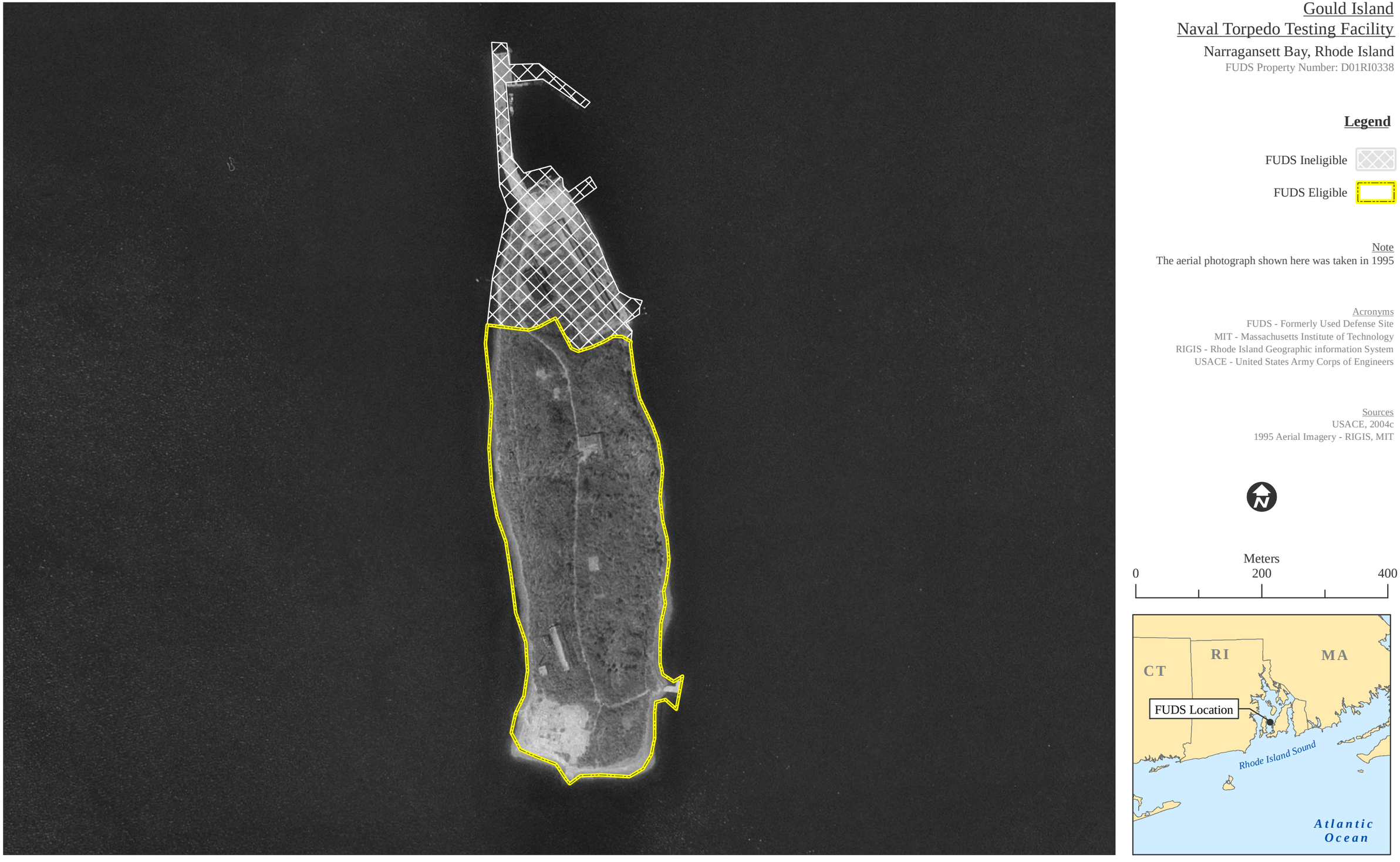


Figure 2-1. Historic Site Layout for Gould Island

Gould Island
Naval Torpedo Testing Facility

Narragansett Bay, Rhode Island

FUDS Property Number: D01RI0338

Legend

MRS Boundary

Potential Area of Interest (PAOI)

FUDS Ineligible

FUDS Eligible

Note

The GIS layer for the disposal area has been revised to reflect SI observations and has been georeferenced to current site conditions.

Acronyms

APFO - Aerial Photography Field Office
FSA - Farm Service Agency
FUDS - Formerly Used Defense Site
MRS - Munitions Response Site
USACE - United States Army Corps of Engineers
USDA - United States Department of Agriculture

Sources

USACE, 2004c
PW Drawing No. 6210-69
USDA-FSA-APFO, 2008

Meters

0 100 200 300

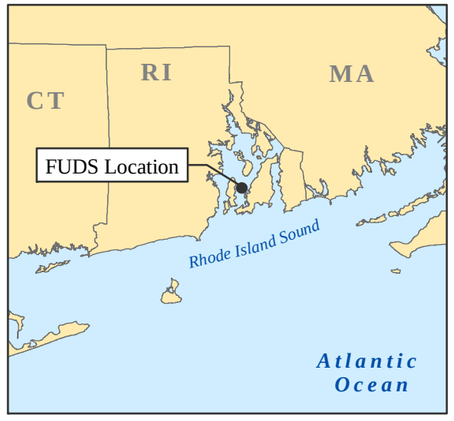


Figure 2-2. Munitions Response Site Boundary

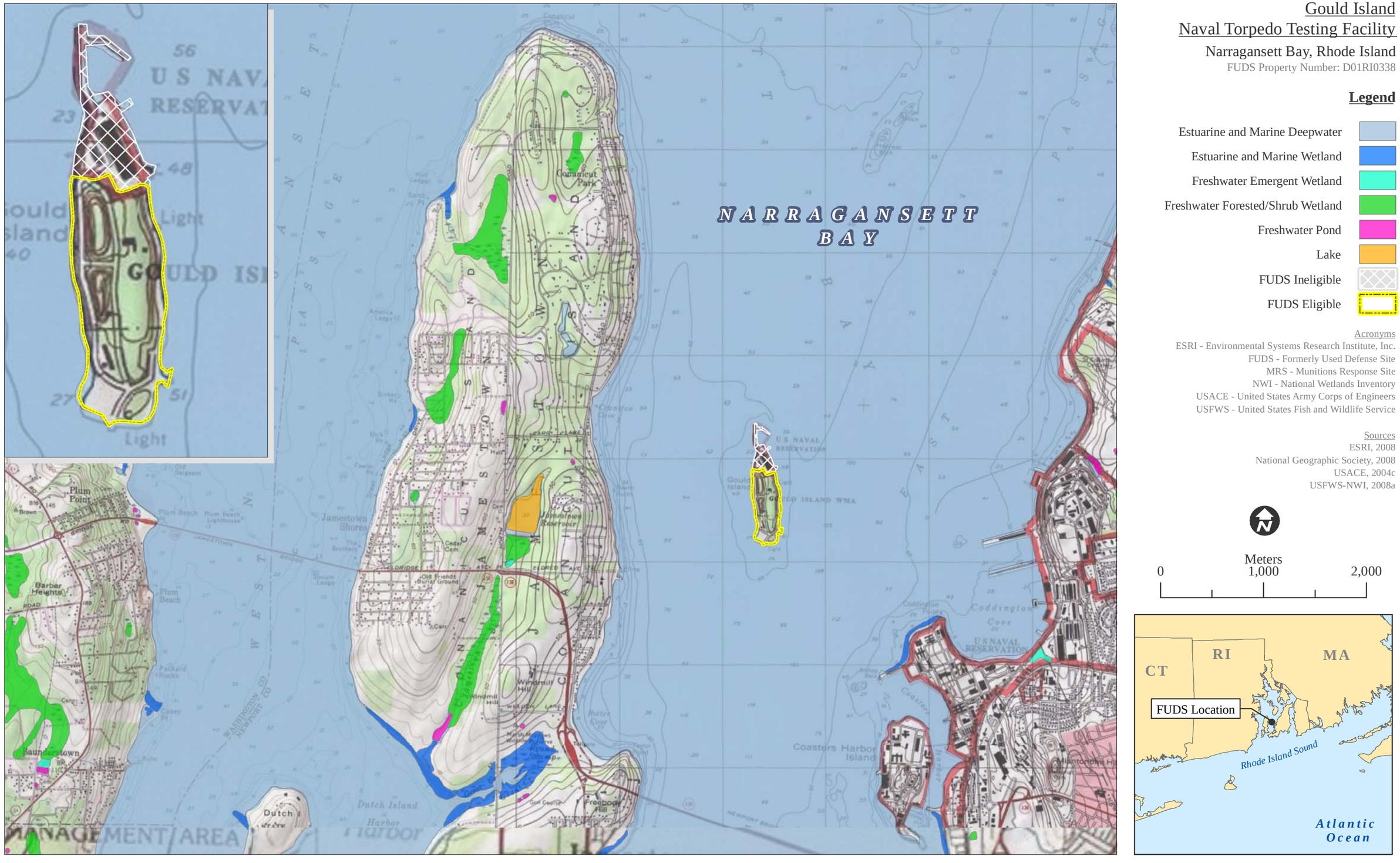
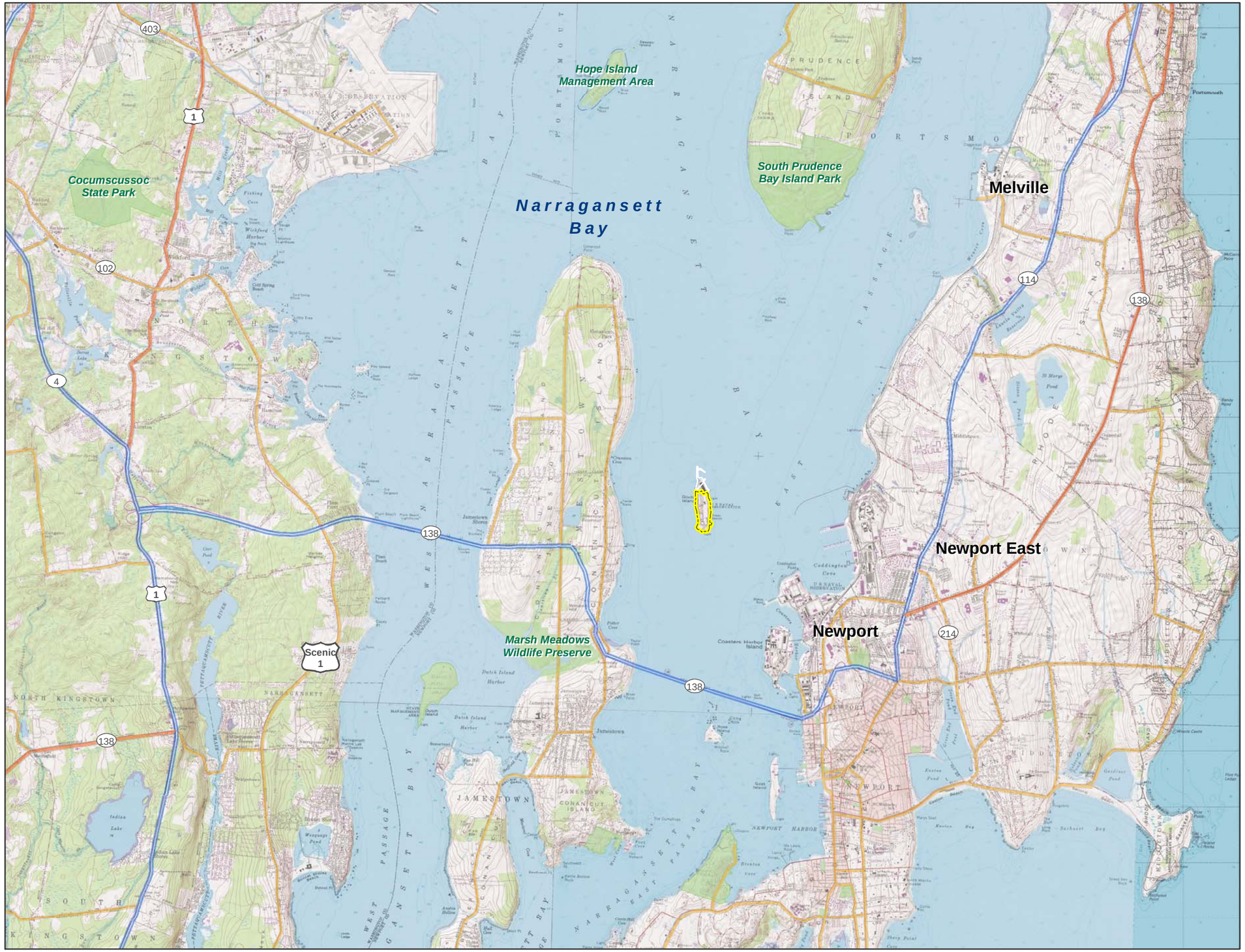


Figure 2-3. Site Location, Topography, and Wetlands

Gould Island
Naval Torpedo Testing Facility

Narragansett Bay, Rhode Island

FUDS Property Number: D01RI0338



Legend

FUDS Ineligible

FUDS Eligible

Acronyms

FUDS - Formerly Used Defense Site
NCGC - National Cartography and Geospatial Center
NRCS - Natural Resources Conservation Service
USACE - United States Army Corps of Engineers
USDA - United States Department of Agriculture

Sources

USACE, 2004c
USDA-NRCS-NCGC, 2002

Miles

0 2

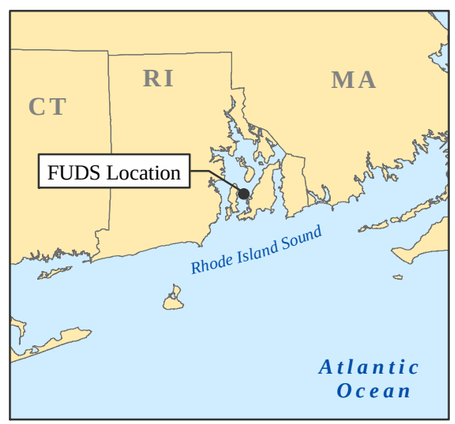


Figure 2-4. General Site Location Map

Gould Island
Naval Torpedo Testing Facility

Narragansett Bay, Rhode Island

FUDS Property Number: D01RI0338

Legend

- Non-Community Wellhead Protection Area
- Community Wellhead Protection Area
- Surface Water Protection Area
- 1/4, 1/2, 1, 2, and 4 Mile Radii
- FUDS Ineligible
- FUDS Eligible

Acronyms

FUDS - Formerly Used Defense Site
NCGC - National Cartography and Geospatial Center
NRCS - Natural Resources Conservation Service
RIGIS - Rhode Island Geographic information System
USACE - United States Army Corps of Engineers
USDA - United States Department of Agriculture

Sources

RIGIS - 2002, 2005
USACE, 2004c
USDA-NRCS-NCGC, 2002

Meters

0 2,000 4,000

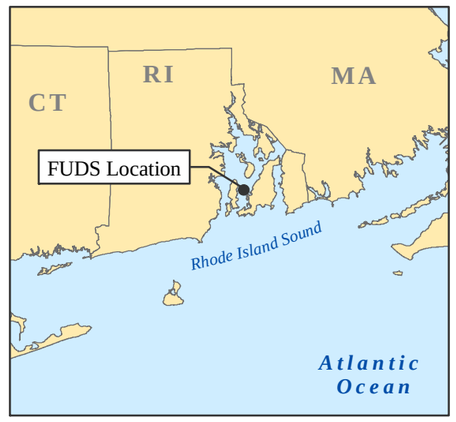


Figure 2-5. Well Locations and Wellhead Protection Areas

3. SITE INSPECTION ACTIVITIES

3.1 Technical Project Planning

3.1.1 The first Technical Project Planning (TPP) Meeting for Gould Island was conducted on 18 April 2008 at the Naval Station Newport located in Newport, Rhode Island. The Final TPP Memorandum documenting the meeting was issued in June 2008 (Alion 2008a). The meeting participants included representatives from and CENAB, EPA, Department of the Navy, RIDEM and the Alion Team. The participants in the TPP discussed the results of previous investigations, historical aerial photographs, the CSM, and the Data Quality Objectives (DQOs). The areas to be assessed as a result of these agreements included MRS 1 and the four PAOIs.

3.1.2 **DQO 1 – Determine if the site requires additional investigation through an RI/FS or if the site may be recommended for No DoD Action Indicated (NDAI) designation based on the presence or absence of MEC and MC. The basis of an RI/FS recommendation, detailed in the DQO of Appendix B, includes evaluation of all evidence (e.g., historic data, field data, etc.), such as the data noted below, to make a final decision for an NDAI designation or RI/FS recommendation (e.g., presence of MD alone will not justify an RI/FS recommendation) as specified below:**

- Historic data that indicate the presence of MEC or MD.
- Visual evidence or surface anomalies which are classified as MEC or MD.
- One or more anomalies near historic or current MEC/MD finds or within a disposal area.
- Physical evidence indicating the presence of MEC (e.g., distressed vegetation, stained soil, ground scarring, bomb craters, burial pits).

3.1.2.1 The basis for an RI/FS recommendation related to the presence/absence of MC includes:

- Maximum concentrations at the FUDS exceed EPA regional screening values based on current and future land use.
- Maximum concentrations at the FUDS exceed EPA interim ecological risk screening values.

- Maximum concentrations at the FUDS exceed site-specific background levels.

- Data indicating the presence or absence (less than Method Detection Limits [MDL] for metals and less than the Reporting Limit [RL] for explosives) of analytes for which no screening criteria are available are to be used to support the weight-of-evidence evaluation of MC at the FUDS.

3.1.2.2 In each of these instances, all lines of evidence (e.g., historic data, field data) are to be used to make a final recommendation for a NDAI designation or RI/FS recommendation. If none of the above scenarios occur, then the recommendation for a NDAI designation for MEC/MC is a possible option.

3.1.3 **DQO 2 – Determine the potential need for a Time Critical Removal Action (TCRA) for MEC and MC by collecting data from previous investigations/reports, conducting site visits, performing analog geophysical activities, and by collecting MC samples.** The basis for recommendations is specified below:

- A TCRA **–** If there is a complete pathway between source and receptor and the MEC/MC and the situation are viewed as an imminent danger posed by the release or threat of a release. Cleanup or stabilization actions must be initiated within six months to reduce risk to public health or the environment.

- A non-TCRA (NTCRA) – If a release or threat of release that poses a risk where more than six months planning time is available.

3.1.3.1 In each of these instances, all lines of evidence (e.g., historic data, field data) are to be used to make a final recommendation for a TCRA or NTCRA.

3.1.4 **DQO 3 – Collect or develop additional data, as appropriate, to support potential Hazard Ranking System scoring by EPA.**

- Verification that data were collected in accordance with the Final SS-WP in the SI Report.

3.1.5 **DQO 4 – Collect the additional data necessary to complete the MRSPP.**

- Completion of the MRSPP for the MRS with all available data and documentation of any data gaps for future annual MRSPP updates.

3.1.6 The TPP meeting participants concurred with the DQOs and the general technical approach for the planned SI activities discussed during the TPP and as revised and subsequently documented in the Final SS-WP (Alion 2008b). In summary, these agreements were to inspect the cited MRS and PAOIs and conduct sampling in accordance with the Final SS-WP and complete the assessment in accordance with the DQOs (Appendix B). As part of this SI Report, Alion evaluated the DQOs presented in the SS-WP (Alion 2008b) and completed a DQO attainment verification worksheet to document completion of the DQOs (Appendix B).

3.2 Supplemental Records Review

3.2.0.1 State and Federal agencies were contacted regarding threatened and endangered species and cultural and ecological resources at the FUDS. The following paragraphs discuss the results of these consultations.

3.2.1 Threatened and Endangered Species

3.2.1.1 As discussed previously in Section 2.3.8.1, RIDEM Division of Fish and Wildlife reported that there are no federally listed species present on Gould Island. However, RIDEM did state that a small heronry exists in the southwest corner of the island and a large gull colony exists on the exposed flat of the former torpedo facility which may be used for breeding, but that the timing of the sampling event would not affect any biological species (RIDEM 2008). In addition, based on a review of the RIDEM website it was noted that Gould Island is designated a "Natural Heritage Area for Rare Species" (RIDEM 2009). Based on the TPP response and the response from the USFWS (USFWS 2008b), RIDEM (RIDEM 2008), and NMFS (NOAA 2008) no expected impacts to potential state or federal T&E species were anticipated and fieldwork proceeded. T&E species consultation responses are provided in Appendix L of this SI Report. Field activities were conducted in a manner and during a time period in which any adverse impacts to potential state or federal T&E species and their habitat was avoided (Appendix L).

3.2.2 Cultural and Archaeological Resources

3.2.2.1 Gould Island is historically significant in regards to the Jamestown area. Originally, the island was purchased from the Narragansett Sachem Koshtotop in 1657 by Thomas Gould. Although no historical sites were identified on Gould Island in the 1995 ASR due to the island's

past uses, there is the potential for historical artifacts to be present on the FUDS, including artifacts associated with the islands past tenants, including Native Americans, two resident dwellings from the late 1800s, and a lighthouse that was in operation until 1947 (USACE 1995).

3.2.2.2 Prior to conducting field work, the USACE and Alion Team consulted with the Rhode Island State Historic Preservation Office to evaluate the potential archaeological/cultural resources at Gould Island. The USACE has determined that there is no impact from the SI activities. The Rhode Island State Historic Preservation Office concurred with this determination (State of Rhode Island 2008) (Appendix L, Section 106 Consultation Response Letter).

3.3 Site Inspection Fieldwork

3.3.1 On 9 December 2008, the Alion field team visited the Gould Island FUDS to conduct SI field activities in accordance with the Programmatic Work Plan and the Final SS-WP (Alion 2005, 2008b). A qualitative magnetometer-assisted site reconnaissance for MEC and sample collection and analysis for possible MC contamination was completed (see Figure 3-1 for the Geophysical Reconnaissance Route). An estimated 1.83 acres of land associated with MRS 1, and PAOIs 1-4 were assessed using qualitative reconnaissance during the field work. A total of three surface soil samples (16-20 in. below ground surface [bgs]), one subsurface soil sample (4 ft bgs), two sediment samples (0-2 in. bgs), and three duplicate samples (one surface soil, one subsurface soil and one sediment) were collected at MRS 1.

3.3.2 MEC reconnaissance findings and MC sample results are discussed in Sections 4 and 5, respectively. Sample locations, sample designations, sampling rationale, and field observations are summarized in Table 3-1. Sampling locations are depicted on Figure 3-1. Additional information pertaining to the field activities, including field notes, forms, and chain of custodies, are provided in Appendix D. A photo documentation log from the SI is included in Appendix E and photo locations are shown on Figure 3-2.

3.4 Work Plan Deviations and Field Determinations

3.4.1 Deviations from the Final SS-WP (Alion 2008b) included changes to sample locations in MRS 1 (Disposal Area). Upon arriving at the site, it was observed that the beach of the disposal area was littered with large amounts of cultural debris (i.e. metal, concrete, and wood) associated with past dumping activities. The anticipated groundwater sample could not be collected during the SI reconnaissance activities. The sample was offset four times but refusal occurred at approximately 1 ft bgs. Refusal was attributed to cobbles and debris which prevented the Field Team from reaching groundwater. The groundwater sample was abandoned in accordance with

the SS-WP.[7] Additionally, only one subsurface soil sample along the eastern portion of the MRS was collected (located 4 ft bgs). Additionally, while attempting to collect the surface soil samples, the field team could not auger below 22 in. bgs due to cultural debris and vegetation. The Alion Project Manager (PM) was notified and it was decided that the surface soil samples would be collected from 16-20 in. bgs instead of the planned depth as the material encountered was not of a cap but rather landfill material. These samples were offset several times due to refusal. While trying to collect subsurface sample GI-DA-SB-30-01, it was determined that after offsetting several times, the Field team could not get below 10 in. Therefore this sample was collected as a surface soil sample (GI-DA-SS-02-03) in accordance with the SS-WP.[8] These deviations were minor in nature and did not affect the quality of data collected. The DQOs were obtained as discussed in the DQO Verification Worksheet included in Appendix B.

3.5 Site Inspection Laboratory Data Quality Indicators

3.5.1 This section summarizes the data quality assessment for the former Gould Island SI analytical data. Data were generated by GPL under the 2006 DoD Quality Systems Manual (QSM) Version III [9] (DoD 2006b) and validated by a third-party (EDS) using EPA Region I Functional Guidelines. The detailed GPL and EDS reports are contained in Appendices F and G, respectively. The data were also analyzed using the Automated Data Review (ADR) Version 8.1 based on the DoD QSM Version III guidelines, and these results are included in the electronic document management systems (EDMS) database. Data Quality Indicators (DQIs) include precision, accuracy, representativeness, completeness, and comparability as well as sensitivity. At the Gould Island FUDS, no quality assurance split samples were collected in accordance with USACE direction. Therefore, the USACE Memorandum for Record-Chemical Quality Assessment Report (CQAR) of Quality Assurance Split Samples is not applicable to this Draft SI Report. However, CENAB has provided a Chemical Data Quality Assessment Report (CDQAR) included in Appendix G of this report.

3.5.2 Precision is a measure of the reproducibility of repetitive measurements of the same process under similar conditions. Precision is determined by measuring the agreement among

[7] The Final SS-WP states that no groundwater sample would be collected if groundwater was not encountered after three attempts or refusal was encountered three times during hand-auguring (Alion 2008b).

[8] The SS-WP states that no subsurface soil sample would be collected if the field team encounters refusal during hand auguring for the collection of subsurface soil samples, but rather a sample would be collected from the material above the depth at which refusal occurs (Alion 2008b).

[9] The latest version of the DoD QSM, Version 4.1, was issued in April 2009; however, this version was not available during the generation of the data for this SI. Note also that this version of the QSM will not take effect until October 2009.

individual measurements of the same property, under similar conditions, and is calculated as an absolute value. The degree of agreement was expressed as the relative percent difference between the separate measurements (usually matrix spike/matrix spike duplicate [MS/MSD] pairs) and the observed relative percent difference compared to acceptable values. Any differences between MS/MSD pairs for the Gould Island FUDS data were examined and any affected sample results qualified as discussed in the Region I Functional Guidelines. MS/MSD samples achieved acceptable values, no qualifiers were necessary and the precision DQI has been achieved. Field precision is measured by the comparison of field duplicate samples, which is also discussed as appropriate in Appendix G.

3.5.3 Accuracy is the degree of agreement of a measurement with an accepted reference or true value. Accuracy measures the bias or systematic error of the entire data collection process. To determine accuracy, a sample that was spiked with a known concentration is analyzed by the laboratory as the MS, MSD, surrogate and blank spikes, or Laboratory Control Spike. EDS assessed accuracy according to Region I Functional Guidelines and assigned qualifiers as appropriate (Appendix G). With the exception of 2,6-dinitrotoluene (DNT) in soil (discussed in greater detail below), these data had acceptable accuracy findings and no qualifiers were necessary. The laboratory control sample for 2,6-DNT was slightly below acceptable standards at 72% recovery. Because of this all 2,6-DNT results were "J" qualified as estimated values (Appendix G). Because all other accuracy quality control measures for 2,6-DNT was acceptable, these data are acceptable for use, and the precision DQI was achieved.

3.5.4 Representativeness expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is achieved through proper development of the field sampling program during the TPP and work plan development. Deviations from the Final SS-WP included no groundwater samples and only one subsurface soil sample collected due to site conditions. Additionally, sample locations were moved slightly due to site-specific conditions. Therefore, the representative DQI was achieved for the Gould Island FUDS.

3.5.5 Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under normal conditions. Data are complete and valid if the data achieve all acceptance criteria including accuracy, precision, and any other criteria specified by the particular analytical method being used. None of the 143 total analyte results associated with this sample effort was rejected; therefore, the completeness indicator is 100 percent. The Gould Island FUDS data meet the completeness data quality indicator.

3.5.6 Comparability expresses the confidence with which one data set can be compared to another based on a comparison of sampling and analytical procedures and characteristics as well as sampling results. There are no previous analyses of explosives MC at the Gould Island FUDS for comparison of reported concentrations from this project. The comparability DQI, therefore, was evaluated with respect to the comparability of sampling results within the data set based on analytical and data validation procedures prescribed in the DQOs. However, the methods used for data collection and analysis during the SI as documented in the SS-WP are comparable to sample collection and analysis methods employed during other USACE investigations including the ongoing HTRW investigation at Gould Island. Therefore, the comparability DQI was achieved.

3.5.7 Sensitivity is a measure of the screening criteria as they compare to detection limits. If screening criteria exceed detection limits, the certainty of "non-detect" data is called into question. The laboratory reported to the RL for explosives, which represents the lowest concentration at which calibration standards were assessed. Consequently, if sensitivity DQIs were satisfied for explosives, there are no issues. Calibration standards are not analyzed between the MDL and the RL. The sensitivity DQI was not achieved for nitroglycerin in soil and sediment, and 1,3,5-trinitrotoluene, 2,4-DNT, 2-nitrotoluene, 3-nitrotoluene, 4-nitrotoluene and 2,4,6-TNT but was achieved for all other analyte/receptor/matrix combinations. Details regarding sensitivity DQO's soil and sediment are discussed in Section 5.1.4. Uncertainties associated with the absence of screening values for specific MC are discussed within the context of analytical sample results in Section 5. This uncertainty discussion indicates that for this particular FUDS, the absence of screening values does not undermine the certainty with which the determinations of risk for human and ecological receptors can be made.

3.6 Second Technical Project Planning Meeting

3.6.1 On the 16th of July 2009, stakeholders had the opportunity to participate in a second TPP meeting to discuss the findings, conclusions and recommendations of the Draft Final SI Report, review the MRSPP report for MRS 1 (Appendix K), and confirm the project objectives and DQOs have been achieved (Alion 2008b). A memorandum, which summarizes the discussions that occurred during this meeting and the DQO verification worksheet, are included in Appendix B.

3.6.2 The following decisions were agreed upon during the second TPP meeting which included RIDEM and other stakeholder personnel:

- RIDEM will forward any comments to Ms. Shia and USACE upon review of the report for incorporation into the Final SI *(Postscript: Mr. Kulpa will provide comments no later than 7August based on an email to Ms. Shia on 29 July 2009).*

- USACE NAE will submit correspondence to RIDEM indicating that munitions analysis (including nitroglycerin) will be carried forward during the ongoing HTRW investigation and the HTRW investigation may include test pits *(Postscript: NAE (Ms. Iorio) in a follow up 17 July 2009 email to Alion indicated that this letter will not be necessary, i.e., details regarding MC sampling and the associated approach will be coordinated with RIDEM through the ongoing HTRW investigation).*

- The Alion Team will review GIS files to insert the tracks around the Torpedo Storehouse. *Completed. Upon review of the GIS tracks, Alion determined that there were tracks around the Torpedo Storehouse, which were not included in the figure. Figure 3-1 will be revised in the Final SI Report to reflect all tracks covered.*

- The scoring of Table 8 in the MRSPP report will be revised from a "2" to a "4" to reflect the wildlife refuge area which encompasses the MRS. *Completed. The scoring was revised which changed the MRS priority from a "6" (E) to a "5" (D).*

- The Alion Team will add a note to the SI report (Page 4-4, Section 4.2.4) indicating the condition of the bunker. *Completed. Upon review of site photographs, Alion determined that the floor at the entrance of the bunker was covered in leaves however the inside of the bunker had a bare concrete floor and there were no evidence of drains however debris was noted on the floor. This photograph will be added to Appendix E of the Final SI Report.*

Table 3-1 Sample Locations and Field Observations

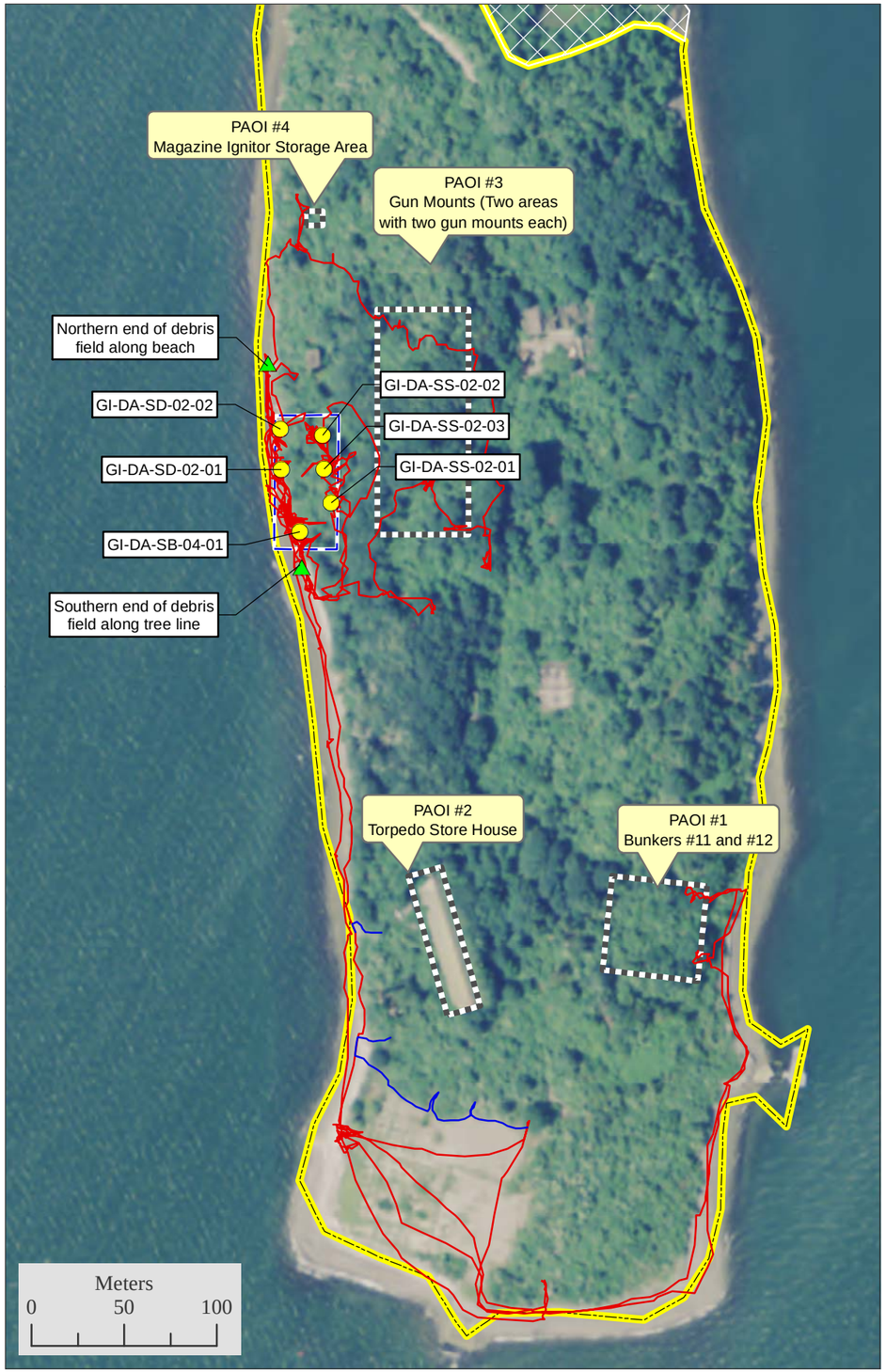
Range Location (MRS)	Sampling Identification	Coordinates (Universal Transverse Mercator , North American Datum 83, (Zone 19 N Meters)		Work Plan Rationale for Sampling Locations	Comments
		Northing (m)	Easting (m)		
MRS 1 – Disposal Area Area	GI-DA-SD-02-01[1]	4600624.60	304299.06	Used as a disposal area (various items). MD including the aft section of a torpedo was identified in this area during the site visit for the ASR.	Evidence of debris surrounding the sample location. Moist Soil.
	GI-DA-SD-02-02	4600646.40	304298.70		Evidence of debris surrounding the sample location. Moist Soil.
	GI-DA-SS-02-01[1]	4600606.72	304326.13		Offset 2 times. Debris on surface and in sample material (asphalt, rock, metal and rust). Dark soil.
	GI-DA-SS-02-02	4600643.04	304321.51		Dark soil, asphalt, tar, oily soil and rust observed in area. Sample offset 3 times.
	GI-DA-SS 02-03	4600624.80	304322.15		Additional sample added because second subsurface soil sample and groundwater sample could not be collected. Relocated 8 times. Rusty soil and wood observed in sample. Mounded areas in the area of the sample.
	GI-DA-SB-04-01[1]	4600591.00	304309.00		Black oily soil with the consistency of tar with a fuel odor.
	GI-DA-GW-10-01	N/A	N/A		Sample was unable to be collected due to refusal in the subsurface.
PAOI 1 (Burial Area)	GI-BA-SS-02-01	N/A	N/A	Samples from PAOI's to be collected based on the protocol and decision criteria specified in this SS-WP (e.g., site access , evidence of past munitions use/disposal, etc.)	Upon performing reconnaissance of the PAOI, no MEC/MD were observed. Thus, in accordance with stakeholder discussions and the Final SS-WP, no samples were collected.
	GI-BA-SS-02-02	N/A	N/A		

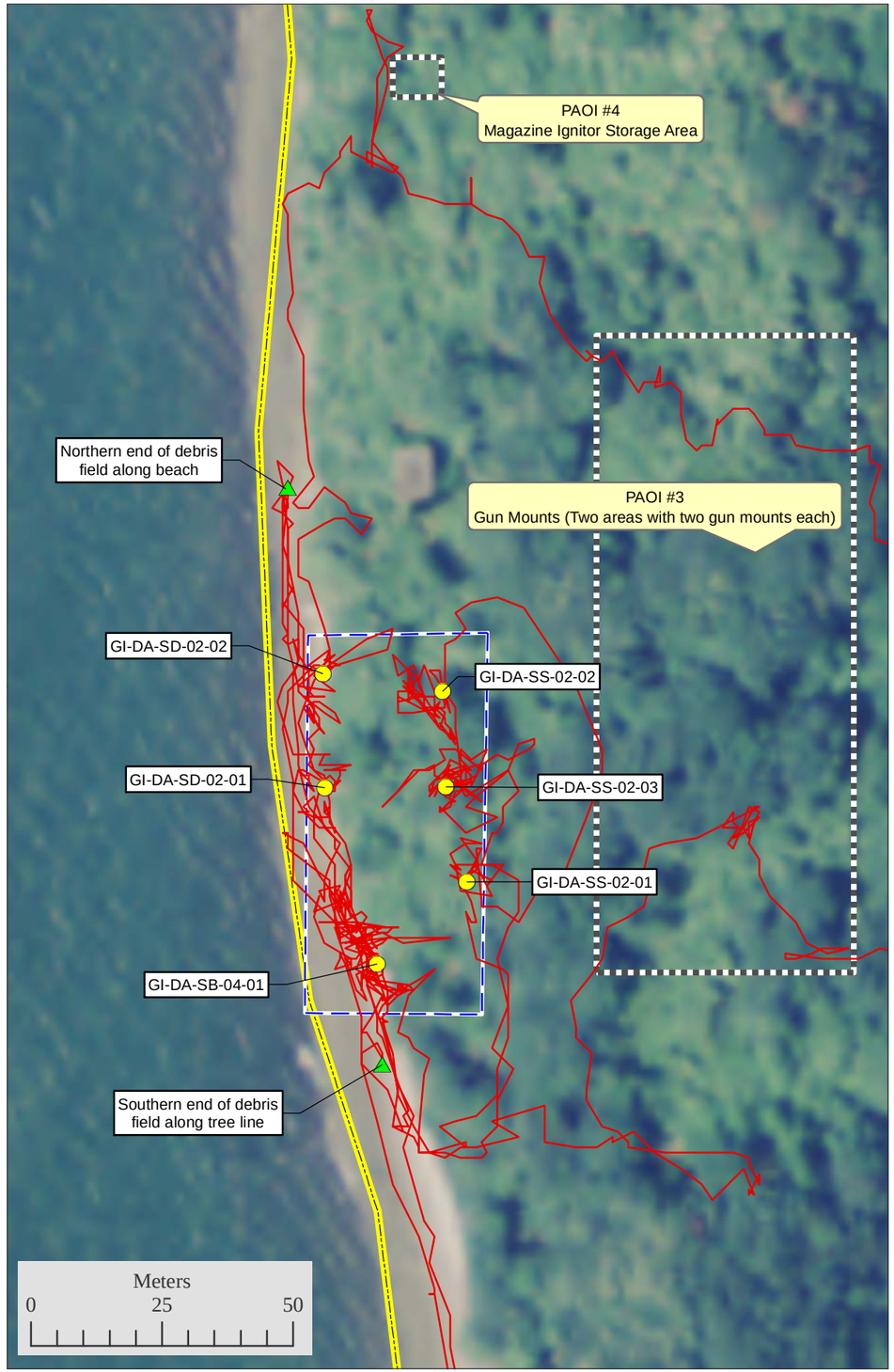
Range Location (MRS)	Sampling Identification	Coordinates (Universal Transverse Mercator , North American Datum 83, (Zone 19 N Meters)		Work Plan Rationale for Sampling Locations	Comments
		Northing (m)	Easting (m)		
PAOI 2 (Torpedo Storehouse)	GI-TS-SS-02-01	N/A	N/A	Samples from PAOI's to be collected based on the protocol and decision criteria specified in this SS-WP (e.g., site access , evidence of past munitions use/disposal, etc.)	Upon performing reconnaissance of the PAOI, no MEC/MD were observed. Thus, in accordance with stakeholder discussions and the Final SS-WP, no samples were collected.
PAOI 3 (Gun Mounts)	GI-GM-SS-02-01	N/A	N/A	Samples from PAOI's to be collected based on the protocol and decision criteria specified in this SS-WP (e.g., site access , evidence of past munitions use/disposal, etc.)	Upon performing reconnaissance of the PAOI, no MEC/MD were observed. Thus, in accordance with stakeholder discussions and the Final SS-WP, no samples were collected.
	GI-GM-SS-02-02	N/A	N/A		Upon performing reconnaissance of the PAOI, no MEC/MD were observed. Thus, in accordance with stakeholder discussions and the Final SS-WP, no samples were collected.
PAOI 4 (Magazine Ignitor Storage Areas)	GI-MS-SS-02-01	N/A	N/A	Samples from PAOI's to be collected based on the protocol and decision criteria specified in this SS-WP (e.g., site access , evidence of past munitions use/disposal, etc.)	Upon performing reconnaissance of the PAOI, no MEC/MD were observed. Thus, in accordance with stakeholder discussions and the Final SS-WP, no samples were collected.
Background	N/A	N/A	N/A	**N/A**	N/A

1. Indicates Field Dup collected (Reference Appendix D).

NOTE:
BA – Bunker Area PAOI – Potential Area of Interest
SB – Subsurface Soil
SD - Sediment
SS – Surface Soil
TS – Torpedo Storehouse

MRS – Munitions Response Site
N/A – Not Applicable
DA – Disposal Area
FUDS – Formerly Used Defense Site.
GM – Gun Mounts
MS – Magazine Ignitor Storage Area





Gould Island
Naval Torpedo Testing Facility

Narragansett Bay, Rhode Island

FUDS Property Number: D01RI0338

Legend

- Sample Location
- Geophysical Reconnaissance
- Tracks Not Captured by GPS
- Potential Area of Interest (PAOI)
- MRS 1 - Disposal Area 14
- FUDS Ineligible
- FUDS Eligible

Notes

1. The GIS layer for the disposal area has been revised to reflect SI observations and has been georeferenced to current site conditions.
2. Due to satellite coverage GPS tracking was not captured around the Torpedo Storehouse. Tracks are in the approximate location traveled by the Field Team.

Sample ID Designation

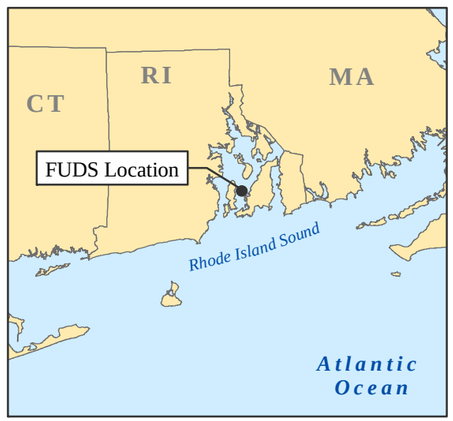
"GI-DA-SS-02-01"

Site Name-Sampling Location-Sample Type-Sample Depth-Sample #

DA - Disposal Area
GI - Gould Island
SB - Subsurface Soil
SD - Sediment
SS - Surface Soil

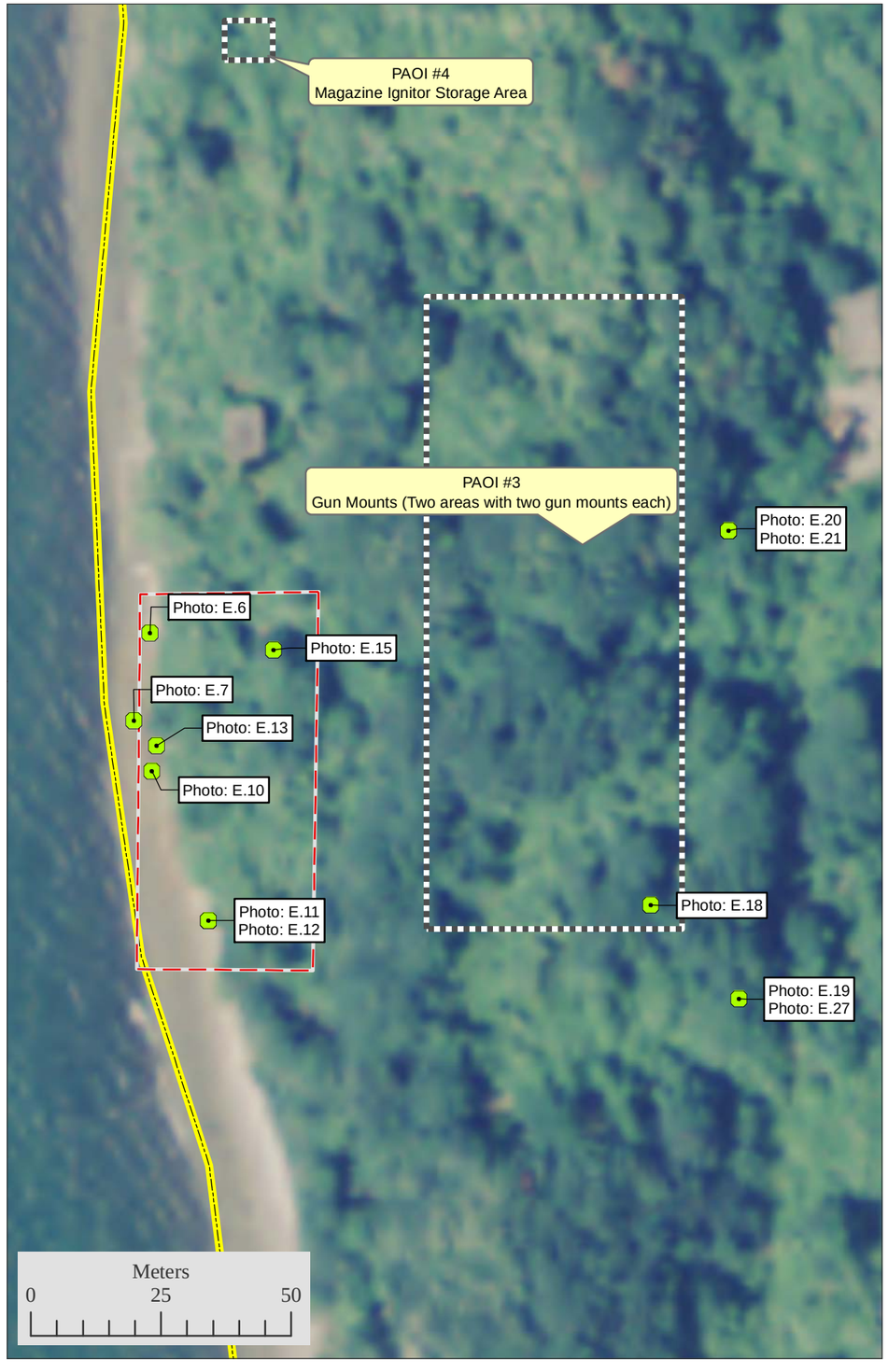
Acronyms

APFO - Aerial Photography Field Office
FSA - Farm Service Agency
FUDS - Formerly Used Defense Site
MRS - Munitions Response Site
USACE - United States Army Corps of Engineers
USDA - United States Department of Agriculture



Sources: USACE, 2004c; PW Drawing No. 6210-69 ; USDA-FSA-APFO, 2008

Figure 3-1. Sample Locations and Geophysical Reconnaissance Findings (MRS 1, PAOI 1, PAOI 2, PAOI 3, and PAOI 4)



Gould Island
Naval Torpedo Testing Facility

Narragansett Bay, Rhode Island

FUDS Property Number: D01RI0338

Legend

- Photograph Location
- MRS Boundary
- Potential Area of Interest (PAOI)
- FUDS Ineligible
- FUDS Eligible

Note

The GIS layer for the disposal area has been revised to reflect SI observations and has been georeferenced to current site conditions.

Acronyms

APFO - Aerial Photography Field Office
FSA - Farm Service Agency
FUDS - Formerly Used Defense Site
MRS - Munitions Response Site
USACE - United States Army Corps of Engineers
USDA - United States Department of Agriculture

Sources

USACE, 2004c
PW Drawing No. 6210-69
USDA-FSA-APFO, 2008

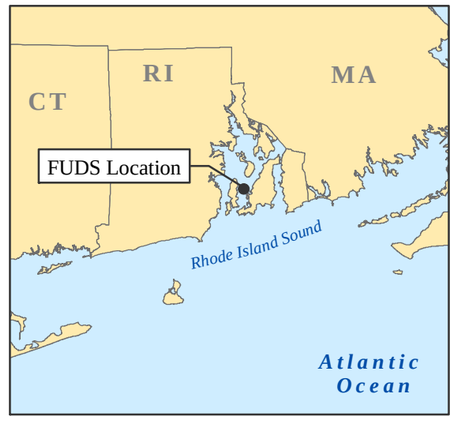


Figure 3-2. Site Inspection Photograph Locations (MRS 1, PAOI 1, PAOI 2, PAOI 3, and PAOI 4)

4. MUNITIONS AND EXPLOSIVES OF CONCERN SCREENING LEVEL RISK ASSESSMENT

4.1 Operational History

4.1.1 The Gould Island facility was responsible for providing overseeing the proof firing of up to 100 inert torpedoes per day for the Navy during the time period ranging from 1 January 1939 to 1 June 1946. Buildings and structures on the site included a pyrotechnic storage building, a magazine igniter storage building, two torpedo warhead storage bunkers (one of which was converted to a pistol range and the other was converted to a storage facility), four gun mounts, a torpedo overhaul shop, and an inert torpedo test facility with a firing pier (USACE 1995).

4.1.2 One MRS was identified at the former Gould Island (See Table 2-1). Historical document reviews performed as part of the SI indicated that MD associated with an inert torpedo (aft section of the torpedo) was found within MRS 1. Munitions present on the FUDS and potentially disposed of in MRS 1 reportedly included flares, signals, simulators, or screening smoke (other than white phosphorous), torpedoes, sea mines, medium caliber (1.1-in.) projectiles and small arms. No DoD related MEC or MD was found at MRS 1 or any of the PAOIs during the 2008 SI sampling activities.

4.1.3 Bunkers 11 and 12 [PAOI 1] were originally used for the storage of ordnance including torpedo warheads. On an unknown date after 1941, the warheads were likely removed and Bunker 11 was subsequently converted to a Pistol Range for weapons qualifications for personnel stationed on the island. Bunker 12 was subsequently converted to a general storage bunker on an unknown date after 1941 (USACE 1995). The ASR noted that torpedo warheads were a highly classified controlled inventory item and that there was no chance of the U.S. Navy leaving a 326-pound (lb) warhead behind when they ceased warhead storage on the island (USACE 1995). Torpedo Store House building 10 [PAOI 2] is located on the southern section of the island. This facility stored torpedoes during World War I and was transformed to inert torpedo storage during World War II. The Four Gun Mounts [PAOI 3] contained 1.1 in. guns manned for the defense of Gould Island during World War II. These were removed after World War II. The Magazine/Ignitor Storage Area building [PAOI 4] was used for the storage of ignitors; however, the usage likely changed in 1941 when the torpedo warheads were removed from the site. No DoD related MEC or MD was found at any of the PAOIs during the 2008 SI sampling activities.

4.2 Reconnaissance/Site Inspection Munitions and Explosives of Concern Field Observations

4.2.0.1 A qualitative reconnaissance (QR) based on both visual observations and analog geophysics was completed. A visual reconnaissance of the site surface was completed to identify MPPEH/MD/MEC, suspect disposal areas, and visual evidence of metallic or other debris associated with munitions. Analog geophysics was used primarily to support anomaly avoidance activities for the field crew.

4.2.0.2 The SI findings are presented below. The total estimated acreage subject to the QR is approximately 1.83 acres of land.[10]

4.2.1 Disposal Area (MRS 1)

4.2.1.1 The Disposal Area (MRS 1) encompasses approximately 0.5 acres. The Alion Team completed land reconnaissance of MRS 1 using a ferrous metal geophysics detector (Schonstedt) following a meandering path. Site reconnaissance pathways are shown on Figure 3-1 and no significant (MEC or MD related) anomalies were identified. Area observations are presented below.

- MRS 1 is located near on the western side of the island south of the portion of the island owned by the Navy. The area is owned and managed by the State of Rhode Island as a wildlife refuge.
- Two sediment, one subsurface soil, and three surface soil samples were collected within MRS 1.
- QR was performed around the beach area (eastern side of MRS 1) and along the top of the cliff wall in MRS 1 (western side). Metal debris (i.e. drums, engine blocks, pipes, flanges, nails, and sheet metal), dried tar, and concrete block were observed covering the ground surface on the beach area. On top of the cliff wall, rusted and crushed drums marked “lube oil”, piles of ash and metal/wood were observed on the surface and in the subsurface. Portions of the area atop of the cliff wall were heavily overgrown with dense thorn bushes and brush.
- Oil soaked sandy soil was observed in the location of the subsurface soil sample between 2.5 and 4 ft bgs.
- No MEC/MD was observed in MRS 1.

[10] Extent of reconnaissance estimated from global positioning system (GPS) tracks and includes a 25-ft diameter around each sample location and observations along the GPS tracks covering a 6-ft swath.

4.2.2 Bunkers #11 and #12 (PAOI 1)

4.2.2.1 Bunkers #11 and #12 (PAOI 1) encompasses approximately 0.5 acres on the eastern side of the island. Alion completed reconnaissance of PAOI 1 using a ferrous metal geophysics detector (Schonstedt) following a meandering path. Site reconnaissance pathways are shown on Figure 3-1 and no significant (MEC or MD related) anomalies were identified. A photograph log is included in Appendix E and the photograph locations are shown on Figure 3-2. Area observations are presented below.

- The former bunkers are located on the southeastern portion of the island and are owned by the State of Rhode Island. Vegetation occupies a large portion of this PAOI.
- Both bunkers are collapsed and were unsafe to enter. Debris blocked the entrance way to Bunker #12 and would further collapse if disturbed. Bunker #11 contained a debris field which could not be traveled over due to safety issues (i.e. tripping hazards and slick surfaces). Debris included brick/block, steel beams and vegetation.
- QR was performed around the entrance of the two bunkers and in the first couple feet of Bunker #11.
- No evidence of MEC/MD or drainage system/drains were observed during QR.
- In accordance with stakeholder agreements and the Final SS-WP, no samples were collected due to the absence of MEC/MD findings within or around this PAOI.

4.2.3 Torpedo Store House (PAOI 2)

4.2.3.1 The Torpedo Store House (PAOI 2) encompasses approximately 0.5 acres. Alion completed reconnaissance of PAOI 2 using a ferrous metal geophysics detector (Schonstedt) following a meandering path. Site reconnaissance pathways are shown on Figure 3-1 and no significant (MEC or MD related) anomalies were identified. A photograph log is included in Appendix E and the photograph locations are shown on Figure 3-2. Area observations are presented below.

- The torpedo storehouse is located on the southern portion of the island (identified as Building 10).
- The field team tried to access this area from different directions; however, the vegetation surrounding this area (sticker bushes) was too thick and no access could be attained.
- No evidence of access to the building was observed while performing QR of the area (i.e. no visible trails and the building looked overgrown).
- No MEC/MD was observed while performing QR in the vegetation surrounding the building.

- In accordance with stakeholder agreements and the Final SS-WP, no samples were collected due to the absence of MEC/MD and lack of access within this PAOI.

4.2.4 North and South Gun Mounts (PAOI 3)

4.2.4.1 The North and South Gun Mounts (PAOI 3) encompass approximately two acres in the middle of the island. Alion completed land reconnaissance of PAOI 3 using a ferrous metal geophysics detector (Schonstedt) following a meandering path. Site reconnaissance pathways are shown on Figure 3-1 and no significant (MEC or MD related) anomalies were identified. A photograph log is included in Appendix E and the photograph locations are shown on Figure 3-2. Area observations are presented below.

- The former gun mount area is located on the middle of the island northeast MRS 1.
- QR was performed within the suspect area of the two former gun mounts areas (north and south).
- The areas surrounding the southern gun mount (#11) was very dense but animal trails (possibly deer) and some open areas allowed for the access to the location of the former gun mount area.
- An old electric pole and sunken area with concrete debris was observed as the only indication of past use of the area. No evidence of MEC/MD or drains were observed around gun mount #11.
- A concrete structure (suspect bunker) east of the gun mount #11 was observed and was noted as being empty (the field team entered the bunker).
- The inside of the bunker had a bare concrete floor and there were no evidence of drains; however, cultural debris was noted on the floor.
- The area surrounding gun mount #12 was also covered with thick vegetation and possible deer trails.
- Reinforced concrete debris was observed around the area of the former gun mount.
- No evidence of MEC/MD were observed around gun mount #12.
- In accordance with stakeholder agreements and the Final SS-WP, no samples were collected due to the absence of MEC/MD and drain findings within this PAOI.

4.2.5 Magazine Ignitor Storage Area (PAOI 4)

4.2.2.1 The Magazine Ignitor Storage Area (PAOI 4) encompasses approximately 0.1 acres on the middle of the island, north of PAOI 3. Alion completed reconnaissance of PAOI 4 using a ferrous metal geophysics detector (Schonstedt) following a meandering path. Site reconnaissance pathways are shown on Figure 3-1 and no significant (MEC or MD related) anomalies were

identified. A photograph log is included in Appendix E and the photograph locations are shown on Figure 3-2. Area observations are presented below.

- The area of the former magazine ignitor storage area was observed to be completely overgrown. The team made several attempts to access the location.
- No evidence of a magazine (i.e. no debris, buildings, etc,) was observed.
- In accordance with stakeholder agreements and the Final SS-WP, no samples were collected due to the absence of MEC/MD findings within this PAOI.

4.2.6 Background Samples

4.2.5.1 No background soil samples were collected at Gould Island in accordance with stakeholder agreements given the inability to determine the source of any metals detected (HTRW versus MMRP related contamination).

4.3 Munitions and Explosives of Concern Risk Assessment

4.3.0.1 A qualitative MEC screening level risk assessment was conducted based on the SI QR, as well as historical data documented in the INPR, ASR, and ASR Supplement (USACE 1992, 1995, and 2004a). An explosive safety risk is the probability of the detonation of an MEC item which could potentially cause harm as a result of human activities. An explosive safety risk exists if a person is in proximity or in contact with MEC and causes a detonation. The potential for an explosive safety risk depends on the presence of three elements: a source (presence of MEC), a receptor (person), and interaction (e.g., touching or picking up an item). The CSMs for MRS 1 and PAOIs 1-4 reflect this MEC assessment strategy (Appendix J).

4.3.0.2 The exposure route for an MEC receptor typically is through direct contact with an MEC item on the surface or through subsurface activities (e.g., digging during construction). A MEC item tends to remain in place unless disturbed through human or natural forces (e.g., frost heaving and erosion). If MEC movement occurs, the probability of direct human contact may increase, but not necessarily result in direct contact or exposure.

4.3.0.3 Each of these primary risk factors was used to evaluate the field and historic data to generate an overall hazard assessment rating of either low, moderate, or high. The MEC source is based on the MEC type, sensitivity, density and depth distribution. The likelihood of exposure and thereby injury, may be severe (lethal if detonation occurs), moderate (minor or major injury if detonation occurs) or low (no detonation and no injury occurs). MEC sensitivity, the likelihood of detonation and severity of exposure (fuzing and weathering, for instance), may be

very sensitive (e.g., electronic fuzing, land mines, booby traps), less sensitive (standard fuzing), and insensitive/inert (residual risk or no injury). MEC density and depth are generally unknown and evaluated during follow on studies (RI/FS).

4.3.0.4 Site characteristics are based on site accessibility (no restrictions, limited restrictions, and complete restrictions to access) and site stability (stable, moderately stable, and unstable). Finally, human interaction includes the type of human contact (low, moderate, and significant), population number and frequency of access (low, moderate, high). Based on these criteria, low, moderate, and high MEC risks are defined in Table 4-1. A summary of the MEC risks for MRS 1 and each PAOI is provided below.

4.3.1 Burial Area (MRS 1)

4.3.1.1 MD (aft section of an inert torpedo) was discovered during the ASR site visit. No MEC/MD was observed during the 2008 SI reconnaissance. Based on review of previous site photographs, the SI Field Team found the area where the aft section of the torpedo was identified during the ASR site visit. It was observed; however, that the torpedo section had been removed from the area. No evidence of MEC or MD was found within MRS 1 during the SI.

4.3.1.2 No documented injuries have occurred at MRS 1. The area is accessible to, visitors and trespassers, clammers and employees/researchers whom are the most likely human receptors. Much of the MRS is covered with metal debris, cobble and concrete block. The overall MEC risk is low based on absence of an MEC source (no previous MEC findings and a single MD discovery almost 15 years ago); site characteristics, (i.e., a stable environment with limited site access as the MRS is on an island only accessible by boat), and limited potential for and limited frequency for receptor exposure (the area is managed as a wildlife refuge). This low risk for MEC exposure scenario is reflected in the CSM (Appendix J).

4.3.2 Bunkers #11 and #12 (PAOI 1)

4.3.2.1 There have been no citizen reports of MD findings within PAOI 1. No munitions were observed by USACE personnel during the 1995 ASR site visit. It was noted that the torpedo warheads originally stored in PAOI 1, were a highly classified and controlled item and that there was no chance of the U.S. Navy leaving a 326-lb warhead behind when the ceased warhead storage on the island (USACE, 1995 and Alion 2008b). No DoD-related MEC/MD was observed during the 2008 SI reconnaissance.

4.3.2.2 No documented injuries have occurred at PAOI 1. The area is accessible to visitors/ trespassers, and employees/researchers whom are the most likely human receptors. Much of the POAI is deteriorated to a hazardous condition (i.e. bunkers caved in and it contains a large debris field). There have been no past findings of MEC or MD and no MEC/MD related to DoD were noted during the SI. The overall MEC risk is low based on the MEC source (warheads were controlled inventory removed from the site and there was no past evidence of MEC/MD), site characteristics restricting continual public access, and the limited potential for receptor exposure. This low risk for MEC exposure scenario is reflected in the CSM (Appendix J).

4.3.3 Torpedo Storehouse (PAOI 2)

4.3.3.1 The storehouse was originally used for the storage of non-explosive torpedo components. There have been no citizen reports of MD findings within PAOI 2. No MEC/MD were observed by USACE personnel during the 1995 ASR site visit and no MEC/MD was observed around the building during the 2008 SI reconnaissance; however, dense vegetation restricted access to this building.

4.3.3.2 No documented injuries have occurred at PAOI 2. Given the dense vegetation, the area is inaccessible to visitors/ trespassers, and employees/researchers whom are the most likely human receptors. Existing site characteristics restrict continual public access (i.e. area is on an island only accessible by boat). There have been no past findings of MEC or MD and none were noted during the SI. The overall MEC risk is low based on the MEC source (non explosive components of torpedoes), site characteristics restricting continual public access, and the limited potential for receptor exposure. This low risk for MEC exposure scenario is reflected in the CSM (Appendix J).

4.3.4 North and South Gun Mounts (PAOI 3)

4.3.4.1 There have been no citizen reports of MEC/MD findings within PAOI 3. No munitions were observed by USACE personnel during the 1995 ASR site visit. Features indicative of the gun mounts (i.e. concrete and empty bunker) were observed. No MEC/MD was observed during the 2008 SI reconnaissance. Dense vegetation surrounded these areas.

4.3.4.2 No documented injuries have occurred at PAOI 3. The area is mostly inaccessible to visitors/trespassers, and employees/researchers whom are the most likely human receptors. Much of the PAOI is covered by dense vegetation, and site characteristics restrict continual public access (i.e. the area which is overgrown is on an island only accessible by boat). There have been no past findings of MEC or MD and none were noted during the SI. The overall MEC risk is low

based on the MEC source (no past evidence of MEC/MD), site characteristics restricting continual public access, and the limited potential for receptor exposure. This low risk for MEC exposure scenario is reflected in the CSM (Appendix J).

4.3.5 Magazine Ignitor Storage Area (PAOI 4)

4.3.5.1 There have been no citizen reports of MD findings within PAOI 4. No munitions were observed by USACE personnel during the 1995 ASR site visit. Dense vegetation prevented access to this area; however, no MEC/MD was observed during the 2008 SI reconnaissance around the location of the former magazine ignitor storage area.

4.3.5.2 No documented injuries have occurred at PAOI 4. The area is accessible to visitors/ trespassers, and employees/researchers whom are the most likely human receptors. Much of the PAOI is covered by dense vegetation, and no features indicative of a magazine were observed. Site characteristics restrict continual public access (i.e. the area which is overgrown is on an island only accessible by boat). There have been no past findings of MEC or MD and none were noted during the SI. The overall MEC risk is low based on the MEC source (no past evidence of MEC/MD), site characteristics restricting continual public access, and the limited potential for receptor exposure. This low risk for MEC exposure scenario is reflected in the CSM (Appendix J).

Table 4-1. Low, Moderate, and High MEC Risk Assessment Categories

MEC Factor	Low MEC Risk	Moderate MEC Risk	High MEC Risk
MEC Source	Low MEC Type (no detonation and no injury) Insensitive/Inert MEC	Moderate MEC Type (minor/major injury) Moderate Sensitive MEC	Severe MEC Type (lethal) Very Sensitive MEC
Site Characteristics	Complete restrictions to access Stable (no MEC exposure by natural events	Limited restrictions to access Moderately stable (MEC may be exposed by natural events)	No restrictions to access Unstable (MEC exposure most likely by natural events)
Human Interactions	Low potential for and frequency of contact (e.g., no general public access, infrequent site access primarily by site personnel, no subsurface activity)	Moderate potential for and frequency of contact (e.g., a limited number of the general public has open and somewhat frequent access, few site uses, surface/subsurface intrusive activity possible)	High potential for and frequency of contact (e.g., general public has open and frequent access, high potential for surface/subsurface intrusive activity)

5. MUNITIONS CONSTITUENTS SAMPLING AND ANALYSIS

5.0.1 A Human Health Risk Assessment (HHRA) and Screening Level Ecological Risk Assessment (SLERA) were conducted to determine whether MC in environmental media at Gould Island may warrant a more detailed assessment of potential risk to current or future human and ecological receptors. The screening methodology, CSM, analytical results for the MC sampling, and results of the screening assessment are presented below. PAOIs 1-4 were not sampled in accordance with stakeholder agreements and the Final SS-WP due to absence of MEC/MD and/or drainage systems as observed during the SI field activities. Therefore, analytical results and screening assessments for the PAOIs are not presented. The CSM for these PAOIs, as presented in Appendix J, notes pathway incompleteness based on the SI results.

5.1 Data Evaluation Methodology

5.1.0.1 The following sections present the process used to evaluate the MC data collected for the Gould Island FUDS. The methodology is designed to evaluate data for relevant MCs in the HHRA and SLERA using the appropriate screening criteria. The methodology also provides a means to evaluate uncertainty in the screening HHRA and SLERA process and provide context for the risk conclusions. This process is consistent with the decision rules outlined in Section 3.1 (TPP) of this report, and is described in more detail in the following sections.

5.1.1 Refinement of Munitions Constituents

5.1.1.1 During the SI process, Alion evaluated MCs potentially associated with the former Gould Island. MCs were identified based on knowledge of munitions historically used at the FUDS. Information on historic use was obtained from munitions data sheets, historical documents, and other munitions reference documents.

5.1.1.2 The list of MCs for the single MRS identified at the Gould Island FUDS is provided below and presented in further detail in Table 2-2.

Disposal Area (MRS 1)

- Explosives – Pentaerythritol tetranitrate (PETN), Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX), Methyl-2,4,6-trinitrophenylnitramine (Tetryl), nitroglycerin, nitrobenzene and Trinitrotoluene (TNT) (and their associated breakdown products to include 2,4-DNT; 2,6-DNT; 1,3,5-trinitrobenzene; nitrotoluene; 2-amino-4,6-DNT; 4-amino-2,6-DNT).

5.1.2 Data Quality

5.1.2.1 Only validated data were used in the screening process. The validated data were composed of the following samples:

1. Three surface soil samples (collected 16-20 in. bgs)
2. One subsurface soil samples (collected 4 ft bgs)
3. Two sediment samples (collected 0-2 in. bgs)
4. One duplicate[11] surface soil sample
5. One duplicate subsurface soil sample
6. One duplicate sediment sample.

5.1.2.2 The first step in the screening risk assessment was the evaluation of the analytical data. Inclusion or exclusion of data on the basis of analytical qualifiers was performed in accordance with U.S. EPA guidance (EPA 1989b). The following provides a listing of the qualifiers in the validated analytical data and their treatment in the risk assessments:

- Analytical results bearing the U qualifier (indicating that the analyte was not detected at the given reporting limit [RL]) or a UJ qualifier (indicating that the analyte was not detected at the given estimated RL) were retained in the data set. The RL was used for non-detect explosives samples.

- Analytical results bearing the R qualifier (indicating that the reported value was rejected) are not retained or used. No data were rejected for the Gould Island FUDS.

5.1.3 Screening Values

5.1.3.1 Screening concentrations were used in the HHRA and SLERA to support risk-based conclusions and recommendations regarding the FUDS property. Maximum property concentrations for relevant MCs were compared to the risk-based concentrations as part of the selection process for COPCs and COPECs.

5.1.3.2 For the HHRA, EPA regional screening levels (SLs) for residential soil and industrial soil (outdoor worker) were selected as the screening criteria to select COPCs in soil. To account for reduced human exposure to sediment, soil SLs were multiplied by 10 to establish sediment SLs.

[11] The duplicate sample was treated as a discrete sample; duplicates were not averaged for the purpose of this risk screening.

The SLs, referred to in this section as "regional SLs" are available from the EPA (EPA 2009). SLs are developed from toxicity values and standard exposure factors to estimate contaminant concentrations that are protective of humans, including sensitive subgroups, over a lifetime. The regional SLs for residential and industrial soils consider exposures through direct contact (e.g., incidental ingestion, dermal contact, inhalation of particulates and vapors) and reflect exposure pathways identified for MCs in the SS-WP that could occur at the FUDS (i.e., potentially complete pathways).

5.1.3.3 The regional SLs for direct contact with soil correspond to typical risk thresholds of a one-in-one million (1×10^{-6}) cancer risk or a non-carcinogenic hazard quotient (HQ) of 1.0. The HHRA screening levels for 2-nitrotoluene and 4-nitrotoluene are based on carcinogenic endpoints. The HHRA screening levels for 2,4-DNT and 2,6-DNT are based on the carcinogenic 2,4-/2,6-DNT mixture cancer endpoint.

5.1.3.4 As discussed in the SS-WP Addendum (Alion 2008b), the screening levels derived from non-carcinogenic endpoints were divided by ten to provide a means to account for potential occurrence of adverse non-carcinogenic health effects due to exposure to multiple non-carcinogens. The application of HHRA screening values is described in Sections 5.1.3.8 and 5.1.3.9. Results of the HHRA are discussed in Section 5.3 and presented in Tables 5-1 and 5-2.

5.1.3.5 Screening for ecological-based COPECs was conducted by calculating an HQ, which represents the ratio of the maximum detected chemical concentration in environmental media to a medium specific ecological screening level. Screening levels derived from studies in specific medium and environmentally similar conditions to those at the FUDS are the most relevant and appropriate for screening. In cases where screening values derived from environmentally specific environments are not available, alternative screening values may offer a sufficient screening tool.

5.1.3.6 Ecological soil screening levels (Eco-SSLs) were used to screen for COPECs in soil (Table 5-4). Eco-SSLs are screening level benchmark concentrations for contaminants in soil that were determined to be protective of terrestrial-based ecological receptors that commonly come into contact with soil or ingest biota that live in or on the soil. These benchmark concentrations generally are used for screening-level purposes to identify COPECs in upland soils that may require further evaluation. Eco-SSLs are derived using information on toxicity and estimated ingestion exposure doses for terrestrial ecological receptors. As described in the SS-WP Addendum CSM diagrams for the Gould Island FUDS, potentially complete pathways for surface soils and sediment to ecological receptors at MRS 1 are ingestion and dermal contact.

EPA guidance states that because dermal pathways are generally less significant compared to ingestion, they do not warrant inclusion in the derivation of eco-SSLs (EPA 2005a). Therefore, the eco-SSLs derived using exposure assumptions for ingestion only, are determined to be adequate for the purposes of the SLERA.

5.1.3.7 No Eco-SSLs were available from EPA for any of the explosives evaluated at the FUDS. Consistent with previous SLERAs under this program, screening values were obtained from Talmage et al. (1999) for these MCs (Table 5-4). The eco-SSLs of 30 milligrams per kilogram (mg/kg) for 2,4-DNT, 2,6-DNT, 2-nitrotoluene, 3-nitrotoluene, and 4-nitrotoluene are based on toxicity data for 2,4,6-TNT (2,4,6-TNT). 2,4,6-TNT can be reduced by several pathways. Although there is not conclusive evidence on the dominant process by which 2,4,6-TNT is reduced in soil, several studies show bacterial degradation of 2,4,6-TNT to 2- and 4- amino-DNT under aerobic and anaerobic conditions (Vorbeck et al. 1998). An *in vitro* study completed in a *Psuedomonas bacterium* species suggests that 2,4,6-TNT breaks down to 2,4-DNT (Haidour and Ramos 1996). Laboratory studies support the observations of Haidour and Ramos (1996) that bacteria strains can generate 2, 4- DNT from TNT (Martin et al. 1997). These findings support the use of TNT as a surrogate for DNT and DNT breakdown products. However, there is not definitive knowledge regarding the reductive processes that dominate TNT breakdown (Vorbeck et al. 1998 and Brannon and Myers 1997); therefore, there is some uncertainty associated with adopting a surrogate screening value from 2,4,6-TNT. A limited amount of data were available for the derivation of eco-SSLs for 2-amino-4,6-DNT, and 4-amino-2,6-DNT. These eco-SSLs were derived using data from a single study in plants. Sediment screening values found in Talmage et al. (1999) are based on organic carbon partitioning of the chemical between surface water and sediment, consequently water toxicity values are necessary. Water toxicity values (and consequently sediment screening values) were only available for 1,3,5-trinitrobenzene and 2,4,6-trinitrotoluene. It was assumed that 2,4-DNT, 2,6-DNT, 2-, 3,-, and 4-nitrotoluene screening values were the same as 2,4,6-TNT.

5.1.3.8 In accordance with EPA Guidance, the following screening process is utilized (EPA 1989a, 1989b, and 1995).

1. The maximum concentration of each chemical detected in each medium is identified.

2. If a chemical was detected in at least one sample in a specific medium, it is retained for consideration in the screening of COPCs/COPECs.

3. If the concentration of a specific chemical exceeds its screening value and is above the maximum and/or mean background concentration, the chemical is retained as a COPC/COPEC.

4. If a screening concentration is not available for a specific chemical in a particular medium, the screening concentration for a structurally similar compound is used, if warranted. The screening tables list any surrogates that are used.

5. An analyte is eliminated from the list of COPCs/COPECs if it is an essential nutrient of low toxicity, and its reported maximum concentration is unlikely to be associated with adverse health impacts.

5.1.3.9 All target analytes detected at the FUDS were evaluated against screening criteria determined for the HHRA. For the HHRA, the maximum detected concentration was compared to the screening value. If the maximum concentration was less than the screening value, the target analyte was eliminated from consideration. If the maximum concentration exceeded the screening value, the analyte was retained as a COPC.

5.1.3.10 Under the SLERA, an HQ analysis was completed for each detected analyte. An HQ is defined as the measured concentration divided by the screening criteria. If the maximum concentration was less than the screening value (HQ < 1.0), the analyte was eliminated from consideration as a COPEC. If the maximum concentration exceeded the screening value (HQ > 1.0), the analyte was retained as a COPEC.

5.1.3.11 For both the HHRA and SLERA, in cases in which no screening criteria are available, any available information regarding the potential for the MC to present a risk to receptors is presented.

5.1.4 Comparison of Screening Levels with Reporting Limits for Never-Detected Analytes

5.1.4.1 The usability of the analytical data for making conclusions regarding risk was evaluated by comparing the RLs (explosives) for never-detected chemicals to their respective screening values used for human health and ecological (Table 5-3) risk screening. If a chemical was never detected, but the RL (explosives) was higher than the screening value, then eliminating the chemical as a COPC or COPEC for the FUDS would introduce uncertainty into the risk assessment. Where no screening values are available, no conclusions can be drawn regarding the adequacy of the RLs for screening risk, and as a result, uncertainty is introduced into the risk assessment.

5.1.4.2 Table 5-3 shows a comparison of the RLs (explosives) and screening values for analytes never detected in soil. The RLs for all never detected explosives in soil were below their respective ecological screening values used in the SLERA (Table 5-4). The eco-SSL for 2,4,6-TNT was adopted for 2,4-DNT, 2,6-DNT, 2-nitrotoluene, 3-nitrotoluene, and 4-nitrotoluene. As described in Section 5.1.3.7, the use of the 2,4,6-TNT screening value for these MCs introduces some uncertainty into the risk screening. The RLs of 0.1 mg/kg for 2,4-DNT and 2,6-DNT and 0.2 mg/kg for 2-nitrotoluene, 3-nitrotoluene, and 4-nitrotoluene are well below the soil screening value of 30 mg/kg adopted for these MC in the SLERA. Therefore, any uncertainties associated with the use of 2,4,6-TNT as a surrogate for these five MCs are determined not to be significant for the SLERA. Since there were no ecological screening levels available for 1,3,5-trinitrobenzene, 1,3-dinitrobenzene, HMX, nitroglycerin or PETN, no conclusion regarding the adequacy of the detection limit obtained for this MC can be made. RLs for never detected analytes were less than the respective human health screening levels (Table 5-3), with the exception of nitroglycerin which was detected in one soil sample (SS-02-02) but no sediment samples. The human health nitroglycerin soil screening value of 0.61 mg/kg is based on 1/10th of the regional residential soil screening value of 6.1 mg/kg compared to an RL of 40 mg/kg for some of the samples. Given that nitroglycerin was detected in one soil sample, it is possible that it may be in other soil samples below 40 mg/kg, but above the screening level. As noted in the SS-WP for Gould Island, the RL is above the screening criterion, thus, the MQO was not met. It follows that the sensitivity DQI for nitroglycerin in soil and sediment was not achieved, and any reported non-detects for nitroglycerin (<RL) do not demonstrate NG contamination is less than the selected screening criterion (0.61 or 6.1 mg/kg for soil or sediment respectively). Consistent with the SS-WP, a weight of evidence approach was utilized during the SI data assessment, and consequently all factors, including detection of nitroglycerin in other media and the detection or non-detection of other explosives has played a role in any decision to proceed or not proceed to the next phase. No human health screening value is available for PETN, consequently no conclusion can be made regarding the adequacy of the detection limit for this chemical.

5.1.4.3 In sediment, all 16 explosives analyzed were never detected above their respective RLs. The RLs for 1,3,5-trinitrobenzene, 2,4-DNT, 2,6-DNT, 2-nitrotoluene, 3-nitrotoluene, 4-nitrotoluene and 2,4,6-TNT were greater than their respective ecological screening values used in the SLERA. Consequently, the sensitivity DQI for sediment with respect to ecological receptors was not achieved and any reported non-detects (<RL) of 1,3,5-trinitrobenzene, 2,4-DNT, 2,6-DNT, 2-nitrotoluene, 3-nitrotoluene, 4-nitrotoluene and 2,4,6-TNT do not demonstrate contamination is less than the ecological screening criterion. The eco-SSL for 2,4,6-TNT was adopted for 2,4-DNT, 2,6-DNT, 2-nitrotoluene, 3-nitrotoluene, and 4-nitrotoluene. Note that the use of the 2,4,6-TNT screening value for these MCs introduces some uncertainty into the risk

screening. Alternatively, most human health screening values except nitroglycerin were greater than the sediment RLs. Consequently, the sensitivity DQI for sediment with respect to human health was achieved for most analytes, except nitroglycerin. The human health nitroglycerin residential screening value of 6.1 mg/kg is based on 1/10th of the regional residential sediment screening value of 61 mg/kg compared to an RL of 40 mg/kg for some of the samples. Since the RL is above the screening criterion, the MQO was not met. It follows that the sensitivity DQI for nitroglycerin in sediment is also not achieved, and any reported non-detects for nitroglycerin (<RL) do not demonstrate that NG contamination is less than the residential screening criterion (6.1 mg/kg). Consequently, it is noted that NG may be present in the sediment samples at a level greater than the screening values, but less than the RL. Consistent with the SS-WP, a weight of evidence approach was utilized during the SI data assessment, and all factors, including detection of nitroglycerin in other media and the detection or non-detection of other explosives has played a role in any decision to proceed or not proceed to the next phase.

5.2 Conceptual Site Model

5.2.0.1 The CSM diagrams for MRS 1, and PAOIs 1-4 for the Gould Island FUDS are provided in Appendix J. The CSM defines the source(s) (e.g., the secondary source/media), interaction (e.g., secondary release mechanism, tertiary source, exposure route), and receptors at the FUDS and provides an overview of completed and potentially completed pathways. The CSM is limited to those areas potentially impacted by MEC and/or MCs based on the site use and history. These areas are shown in Figure 2-2. In this SI Report, the CSM was revised from the version presented in the Final SS-WP to reflect the results of the human and ecological risk screening (Alion 2008b).

5.2.0.2 Current and future potential human receptors for the FUDS are expected to be visitors/trespassers, clammers, and employees/researchers. In the HHRA, the screening values for the trespassers/visitors were based on regional SLs for direct contact with residential soil. The screening values used for clammers and employees/researchers were based on the regional SLs for direct contact with industrial soils. Both residential and industrial criteria have been used in the screening process (Table 5-1); however, in accordance with stakeholder agreements exceedances of residential criteria will result in identification of a COPC. The RI/FS decision is still based on the weight-of-evidence approach as discussed below in 5.2.0.5. The ecological receptors of concern for the FUDS are plants, benthic invertebrates, terrestrial-feeding mammals, and terrestrial-feeding birds. Screening values selected for the SLERA were applied uniformly to all ecological receptors. As described in the Final SS-WP for the Gould Island FUDS, there are no permanent non-tidal surface water bodies within the FUDS. According to stakeholders at the TPP meeting, no drinking water wells are located in MRS 1 at Gould Island (Alion 2008a and

2008b). Stakeholders indicated that the groundwater at the site may not be tidally influenced. Based on this discussion, groundwater was identified as a medium of concern at MRS 1. However, groundwater was unable to be sampled due to refusal in the subsurface; therefore, the groundwater pathway remains as potentially complete.

5.2.0.3 Potentially complete pathways for human and ecological receptors are based on the presence of MEC/MC and interactions including transport and release mechanisms and receptor use patterns.

5.2.0.4 A pathway is complete if all of the following conditions are present:

1. Source and mechanism of chemical release (e.g. a munitions-related organic chemical is detected or site metal concentrations exceed background concentrations).
2. Transfer mechanisms (e.g. overland flow of contaminants into an adjacent stream, advection of contaminants with groundwater flow).
3. Point of contact (exposure point, e.g., drinking water, soil).
4. Exposure route to receptor (e.g., ingestion, inhalation, etc.).

5.2.0.5 Once a complete pathway is determined to exist between media and receptors, as discussed in Section 5.2.0.4, comparisons of maximum detected site concentrations to risk-based screening values are used to determine if the MC is a COPC or COPEC, depending on the risk screening being conducted (human health and ecological, respectively). Using a weight of evidence approach, a RI/FS may be recommended for MC where COPC and/or COPEC are identified. An NDAI designation may be recommended for MC if there are no MC detections, no COPCs or COPECs are identified through the risk screening process, or if the weight of evidence evaluation indicates that COPCs/COPECs do not pose an unacceptable risk to the exposed receptor.

5.2.0.6 In conclusion, pathway completeness will result in an RI/FS recommendation for MC only in the instance where risk screening criteria exceedances occur since excessive risk may exist with sufficient exposure, which typically warrants further investigation. A pathway can be complete but an RI/FS is not recommended if there are no exceedances of risk screening criteria or if identified risks are determined to be at acceptable risk levels. When a pathway is incomplete, an RI/FS recommendation is not made.

5.3 Background Data Evaluation

5.3.0.1 In accordance with stakeholder agreements, no background soil samples were collected at Gould Island given the inability to determine the source of any metals detected (HTRW versus MMRP related contamination) (Alion 2008a and 2008b)

5.4 Disposal Area (MRS 1)

5.4.0.1 As presented in Section 5.1.1, TNT and its breakdown products, DNT, PETN, RDX, HMX, tetryl nitroglycerin and nitrobenzene were identified as the MCs for evaluation in MRS 1. Surface soil, subsurface soil, sediment, and groundwater were identified as the media of concern within MRS 1.

5.4.1 Terrestrial Pathway and Screening Results

5.4.1.1 Potentially complete exposure pathways in surface soils were identified initially for human and ecological receptors. Three surface soil samples and one duplicate surface soil and one subsurface soil sample and a duplicate sample were collected in MRS 1 in the area of the former disposal area. All samples were analyzed for TNT and its breakdown products, DNT, PETN, RDX, HMX, tetryl nitroglycerin and nitrobenzene. Table 5-1 presents the analytical results for surface/subsurface soils along with the human health and ecological screening values described previously in Section 5.1.3.

5.4.1.2 As described in the SS-WP Addendum for Gould Island, the incidental ingestion of and dermal contact with MC from surface soil were identified as potentially complete pathways for visitors/trespassers, employees/researchers, clammers, and biota. Potentially complete exposure pathways were also noted for biota from ingestion of vegetation and game. Within subsurface soil, incidental ingestion, dermal contact with and inhalation were identified as potentially complete pathways for employees/researchers.

5.4.1.3 With the exception of nitroglycerin, no explosives were detected in concentrations above their respective reporting limits in surface soil samples collected at MRS 1. The reporting limits for RDX, HMX, Tetryl, and TNT and its breakdown products were below the screening criteria selected for the HHRA (Table 5-2), which confirms the ability of the analytical techniques to detect the MCs at levels sufficient to screen for risks to human receptors. Within MRS 1, nitroglycerin was detected in surface soil at a concentration above its respective reporting limit. Nitroglycerin detected in the sample GI-DA-SS-02-01 at levels (1,200 mg/kg) which exceeded the regional screening level (0.61 mg/kg) for residential soil. Nitroglycerin was identified as a COPC within MRS 1 due to exceedance of regional screening criteria. Given that nitroglycerin

was detected above the regional screening criteria, the surface soil pathway is complete for human receptors. No COPCs were identified for subsurface soil at MRS 1 because no explosives were detected. However, MQOs for sensitivity were not met for nitroglycerin; therefore, nitroglycerin contamination may be present in subsurface soil at concentrations above the screening limit. The subsurface soil pathway remains potentially complete.

5.4.1.4 As described above, the only explosive MC detected in surface soil was nitroglycerin. The ecological HQ value for nitroglycerin could not be reported because it lacks a respective ecological screening value. The reporting limits for RDX, HMX, Tetryl, and TNT and its breakdown products were below the ecological screening criteria selected for the SLERA. This confirms the ability of the analytical techniques to detect the MCs at levels sufficient to screen for risks to ecological receptors. Given nitroglycerin was detected, the surface soil pathway is complete for ecological receptors at MRS 1. Since there are no exceedances of ecological screening criteria, no COPECs were identified for ecological receptors in surface soils at MRS 1. The subsurface soil pathway is incomplete for ecological receptors due to lack of exposure.

5.4.2 Groundwater Pathway and Screening Results

5.4.2.1 Potentially complete exposure pathways in groundwater were initially identified for human receptors. The proposed groundwater sample was unable to be collected after offsetting the sample multiple times in the field due to debris/refusal in the subsurface. The groundwater sample was abandoned as discussed previously in Section 3.4.1. The pathway in the CSM remains potentially complete in this SI report.

5.4.3 Surface Water and Sediment Pathway and Screening Results

5.4.3.1 There are no permanent non-tidal surface water bodies located on the FUDS. As noted in the Final SS-WP, surface water was not a potentially complete pathway for MC for MRS 1 (Alion 2008b). No surface water sampling was conducted in this MRS. The pathway in the CSM is identified as incomplete in this SI report.

5.4.3.2 Sediment was identified as a potentially complete pathway for MC for MRS 1 in the SS-WP (Alion 2008b). Two sediment samples were collected 0-2 in. bgs within the shore area of MRS 1 away from the tidal waters. Samples were located in low lying areas downgradient of the landfill in areas which may be subject to ponding during high tide or rain storms. Sediment samples were analyzed for explosives (Table 5-2). All sediment samples analyzed for explosives were reported as non-detect. However, as MQOs for sensitivity were not met for 2,4,6-TNT,

2,4-DNT, 2,6-DNT, 2-nitrotoluene, 3-nitrotoluene, and 4-nitrotoluene with regard to ecological screening levels, contamination may be present in the sediment at concentrations above the ecological screening limit. Therefore, the pathway in the CSM is identified potentially complete in this SI Report and no COPCs/COPECs were identified.

5.4.4 Air Pathway

5.4.4.1 The air migration pathway for MRS 1 has an extremely low potential, if any, for human and/or ecological receptors to come into contact with the analytes detected in surface soil (given the thick vegetative cover). The pathway in the CSM is identified as incomplete in the SI report.

		Sample Name:	USEPA Regional Residential Screening Value (1)	USEPA Regional Industrial Screening Value (1)	Ecological Screening Value (2)	GI-DA-SB-04-01	GI-SB-DUP1	GI-DA-SS-02-01	GI-SS-DUP1	GI-DA-SS-02-02	GI-DA-SS-02-03
		Sample Date:				12/9/2008	12/9/2008	12/9/2008	12/9/2008	12/9/2008	12/9/2008
		Parent Name:					GI-DA-SB-04-01		GI-DA-SS-02-01		
		MRS:				MRS 1	MRS 1	MRS 1	MRS 1	MRS 1	MRS 1
Analyte	**CAS**	**Unit**									
1,3,5-TRINITROBENZENE	99-35-4	mg/kg	220	2700	NSL	0.4 U	0.4 U	0.08 U	0.4 U	0.4 U	0.4 U
1,3-DINITROBENZENE	99-65-0	mg/kg	0.61	6.2	NSL	0.4 U	0.4 U	0.08 U	0.4 U	0.4 U	0.4 U
2,4-DINITROTOLUENE	121-14-2	mg/kg	0.71	2.5	30	0.4 U	0.4 U	0.08 U	0.4 U	0.4 U	0.4 U
2,6-DINITROTOLUENE	606-20-2	mg/kg	0.71	2.5	30	0.4 UJ	0.4 UJ	0.08 UJ	0.4 UJ	0.4 UJ	0.4 UJ
2-AMINO-4,6-DINITROTOLUENE	35572-78-2	mg/kg	15	200	80	0.4 U	0.4 U	0.08 U	0.4 U	0.4 U	0.4 U
2-NITROTOLUENE	88-72-2	mg/kg	2.9	13	30	0.8 U	0.8 U	0.16 U	0.8 U	0.8 U	0.8 U
3-NITROTOLUENE	99-08-1	mg/kg	120	1200	30	0.8 U	0.8 U	0.16 U	0.8 U	0.8 U	0.8 U
4-AMINO-2,6-DINITROTOLUENE	19406-51-0	mg/kg	15	190	80	0.4 U	0.4 U	0.08 U	0.4 U	0.4 U	0.4 U
4-NITROTOLUENE	99-99-0	mg/kg	24	110	30	0.8 U	0.8 U	0.16 U	0.8 U	0.8 U	0.8 U
HMX	2691-41-0	mg/kg	380	4900	NSL	0.8 U	0.8 U	0.16 U	0.8 U	0.8 U	0.8 U
NITROBENZENE	98-95-3	mg/kg	3.1	28	40	0.4 U	0.4 U	0.08 U	0.4 U	0.4 U	0.4 U
NITROGLYCERIN	55-63-0	mg/kg	0.61	6.2	NSL	40 U	40 U	8 U	40 U	**1200**	40 U
PETN	78-11-5	mg/kg	NSL	NSL	NSL	2 U	2 U	0.4 U	2 U	2 U	2 U
RDX	121-82-4	mg/kg	5.5	24	100	0.8 U	0.8 U	0.16 U	0.8 U	0.8 U	0.8 U
TETRYL	479-45-8	mg/kg	24	250	25	0.8 U	0.8 U	0.16 U	0.8 U	0.8 U	0.8 U
TNT	118-96-7	mg/kg	3.6	42	30	0.4 U	0.4 U	0.08 U	0.4 U	0.4 U	0.4 U

Notes:

(1) United States Environmental Protection Agency (EPA). 2009. Regional Screening Levels. Available from http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm. Accessed April 2009. USEPA Region III recommendations for lead. For non-carcinogens, except lead, value shown is equal to 1/10 the regional soil value. For carcinogens the value shown is equal to the regional soil value.

(2) Ecological Screening Value references are found in Table 5-4.

SB=subsurface soil

SS=surface soil

U=Not detected. The associated number indicates the approximate sample concentration necessary to be detected.

UJ=Not detected, quantitation limit may be inaccurate or imprecise.

mg/kg=milligrams per kilogram

CAS=Chemical Abstract Service

NSL=No Screening Level

Notes:

Blue shaded and bolded values represent exceedance of human health screening criteria.

Blue shaded and italicized values represent exceedance of ecological screening criteria.

Blue shaded, bolded and italicized values represent exceedance of both human health and ecological screening criteria.

Lavender shaded compounds are the maximum detected MC of concern for a given MRS that is above a screening criteria..

Sample Name:			USEPA Regional Residential Screening Value (1)	USEPA Regional Industrial Screening Value (1)	Ecological Screening Value (2)	GI-DA-SD-02-01	GI-SD-DUP1	GI-DA-SD-02-02
Sample Date:						12/9/2008	12/9/2008	12/9/2008
Parent Name:							GI-DA-SD-02-01	
MRS:						MRS 1	MRS 1	MRS 1
Analyte	**CAS**	**Unit**						
1,3,5-TRINITROBENZENE	99-35-4	mg/kg	2200	27000	.24	0.4 U	0.4 U	0.4 U
1,3-DINITROBENZENE	99-65-0	mg/kg	6.1	62	NSL	0.4 U	0.4 U	0.4 U
2,4-DINITROTOLUENE	121-14-2	mg/kg	7.1	25	0.09	0.4 U	0.4 U	0.4 U
2,6-DINITROTOLUENE	606-20-2	mg/kg	7.1	25	0.09	0.4 UJ	0.4 UJ	0.4 UJ
2-AMINO-4,6-DINITROTOLUENE	35572-78-2	mg/kg	150	2000	NSL	0.4 U	0.4 U	0.4 U
2-NITROTOLUENE	88-72-2	mg/kg	29	130	0.09	0.8 U	0.8 U	0.8 U
3-NITROTOLUENE	99-08-1	mg/kg	1200	12000	0.09	0.8 U	0.8 U	0.8 U
4-AMINO-2,6-DINITROTOLUENE	19406-51-0	mg/kg	150	1900	NSL	0.4 U	0.4 U	0.4 U
4-NITROTOLUENE	99-99-0	mg/kg	240	1100	0.09	0.8 U	0.8 U	0.8 U
HMX	2691-41-0	mg/kg	3800	49000	NSL	0.8 U	0.8 U	0.8 U
NITROBENZENE	98-95-3	mg/kg	31	280	NSL	0.4 U	0.4 U	0.4 U
NITROGLYCERIN	55-63-0	mg/kg	6.1	62	NSL	40 U	40 U	40 U
PETN	78-11-5	mg/kg	NSL	NSL	NSL	2 U	2 U	2 U
RDX	121-82-4	mg/kg	55	240	NSL	0.8 U	0.8 U	0.8 U
TETRYL	479-45-8	mg/kg	240	2500	NSL	0.8 U	0.8 U	0.8 U
TNT	118-96-7	mg/kg	36	420	0.09	0.4 U	0.4 U	0.4 U

Notes:

(1) United States Environmental Protection Agency (EPA). 2009. Regional Screening Levels. Available from http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm. Accessed April 2009. USEPA Region III recommendations for lead. For non-carcinogens, except lead, value shown is equal to 1/10 the regional soil value. For carcinogens the value shown is equal to the regional soil value. The resulting value is multiplied by 10 to account for sediment exposure.

(2) Ecological Screening Value references are found in Table 5-4.

SD=sediment

U=Not detected. The associated number indicates the approximate sample concentration necessary to be detected.

UJ=Not detected, quantitation limit may be inaccurate or imprecise.

mg/kg=milligrams per kilogram

CAS=Chemical Abstract Service

NSL=No Screening Level

Notes:

Blue shaded and bolded values represent exceedance of human health screening criteria.

Blue shaded and italicized values represent exceedance of ecological screening criteria.

Blue shaded, bolded and italicized values represent exceedance of both human health and ecological screening criteria.

Lavender shaded compounds are the maximum detected MC of concern for a given MRS that is above a screening criteria..

Table 5-3
Non-Detection Concentrations and Screening Values for Human Health and Ecological Risk

Analyte	Cas no.	Units	Minimum Non-Detect Concentration	Maximum Non-Detect Concentration	USEPA Regional Screening Value [1]	Ecological Screening Value [2]
Soil						
Explosives						
1,3,5-TRINITROBENZENE	99-35-4	mg/kg	0.4	0.4	220	NSL
1,3-DINITROBENZENE	99-65-0	mg/kg	0.24	0.4	0.61	NSL
2,4-DINITROTOLUENE	121-14-2	mg/kg	0.24	0.4	0.71	30
2,6-DINITROTOLUENE	606-20-2	mg/kg	0.24	0.4	0.71	30
2-AMINO-4,6-DINITROTOLUENE	35572-78-2	mg/kg	0.24	0.4	15	80
2-NITROTOLUENE	88-72-2	mg/kg	0.48	0.8	2.9	30
3-NITROTOLUENE	99-08-1	mg/kg	0.48	0.8	120	30
4-AMINO-2,6-DINITROTOLUENE	19406-51-0	mg/kg	0.24	0.4	15	80
4-NITROTOLUENE	99-99-0	mg/kg	0.48	0.8	24	30
HMX	2691-41-0	mg/kg	0.48	0.8	380	NSL
NITROBENZENE	98-95-3	mg/kg	0.24	0.4	3.1	40
PETN	78-11-5	mg/kg	1.2	2	NSL	NSL
RDX	121-82-4	mg/kg	0.48	0.8	5.5	100
TETRYL	479-45-8	mg/kg	0.48	0.8	24	25
TNT	118-96-7	mg/kg	0.24	0.4	3.6	30
Sediment						
Explosives						
1,3,5-TRINITROBENZENE	99-35-4	mg/kg	0.4	0.4	2200	0.24
1,3-DINITROBENZENE	99-65-0	mg/kg	0.4	0.4	6.1	NSL
2,4-DINITROTOLUENE	121-14-2	mg/kg	0.4	0.4	7.1	0.09
2,6-DINITROTOLUENE	606-20-2	mg/kg	0.4	0.4	7.1	0.09
2-AMINO-4,6-DINITROTOLUENE	35572-78-2	mg/kg	0.4	0.4	150	NSL
2-NITROTOLUENE	88-72-2	mg/kg	0.8	0.8	29	0.09
3-NITROTOLUENE	99-08-1	mg/kg	0.8	0.8	1200	0.09
4-AMINO-2,6-DINITROTOLUENE	19406-51-0	mg/kg	0.4	0.4	150	NSL
4-NITROTOLUENE	99-99-0	mg/kg	0.8	0.8	240	0.09
HMX	2691-41-0	mg/kg	0.8	0.8	3800	NSL
NITROBENZENE	98-95-3	mg/kg	0.4	0.4	31	NSL
NITROGLYCERIN	55-63-0	mg/kg	40	40	6.1	NSL
PETN	78-11-5	mg/kg	2	2	NSL	NSL
RDX	121-82-4	mg/kg	0.8	0.8	55	NSL
TETRYL	479-45-8	mg/kg	0.8	0.8	240	NSL
TNT	118-96-7	mg/kg	0.4	0.4	36	0.09

[1] USEPA Regional Screening Levels, USEPA, April 2008. For non-carcinogens, except lead, value shown is equal to 1/10 the residential soil value. The resulting rsidential value is multiplied by 10 to account for sediment exposure.

[2] Ecological Screening Value references are found in Table 5-4.

NSL=No Screening Level

mg/kg=milligrams per kilogram

Table 5-4. Sediment and Soil Ecological Screening Values and Sources

Analyte	Screening Value	Screening Source
Sediment (mg/kg)		
1,3,5-TRINITROBENZENE	0.24	Talmage et al. (1999)
1,3-DINITROBENZENE	NSV	
2,4-DINITROTOLUENE	0.09	TNT as surrogate
2,6-DINITROTOLUENE	0.09	TNT as surrogate
2-AMINO-4,6-DINITROTOLUENE	NSV	
2-NITROTOLUENE	0.09	TNT as surrogate
3-NITROTOLUENE	0.09	TNT as surrogate
4-AMINO-2,6-DINITROTOLUENE	NSV	
4-NITROTOLUENE	0.09	TNT as surrogate
HMX	NSV	
NITROBENZENE	NSV	
NITROGLYCERIN	NSV	
PETN	NSV	
RDX	NSV	
TETRYL	NSV	
TNT	0.09	Talmage et al. (1999)

Analyte	Screening Value	Screening Source
Surface Soil (mg/kg)		
1,3,5-TRINITROBENZENE	NSV	
1,3-DINITROBENZENE	NSV	
2,4-DINITROTOLUENE	30	TNT as surrogate
2,6-DINITROTOLUENE	30	TNT as surrogate
2-AMINO-4,6-DINITROTOLUENE	80	Talmage et al. (1999)
2-NITROTOLUENE	30	TNT as surrogate
3-NITROTOLUENE	30	TNT as surrogate
4-AMINO-2,6-DINITROTOLUENE	80	2-amino-4,6-dinitrotoluene as surrgoate
4-NITROTOLUENE	30	TNT as surrogate
HMX	NSV	
NITROBENZENE	40	Efroymson et al. (1997b)
NITROGLYCERIN	NSV	
PETN	NSV	
RDX	100	Talmage et al. (1999)
TETRYL	25	Talmage et al. (1999)
TNT	30	Talmage et al. (1999)

NSV - No screening value
mg/kg = milligram per kilogram

References:

Efroymson, R.A., M.E. Will, and G.W. Suter II. 1997b. Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision. U.S. Department of Energy, Office of Environmental Management. November.

Talmage, S.S., D.M. Opresko, C.J. Maxwell, J.E. Welsh, M. Cretella, P.H. Reno, and F.B. Daniel. 1999. Nitroaromatic munition compounds: Environmental effects and screening values. Reviews in Environmental Contamination and Toxicology. 161: 1-156

6. SUMMARY AND CONCLUSIONS

6.0.1 The FUDS portion of Gould Island is comprised of approximately 39.15 acres of land located in Narragansett Bay approximately three and a half miles east of Jamestown, Rhode Island. The NAD 1983 UTM X and Y coordinates for the approximate center of the FUDS boundary are 304324 meters (Easting) and 4600529 meters (Northing), respectively. The SI is being completed under DERP-FUDS Project No. D01RI033803 to address potential MMRP hazards remaining at the FUDS.

6.0.2 One MRS and four PAOI's were identified for investigation at the Gould Island FUDS, as follows:

- MRS 1 – Disposal Area
- PAOI 1 – Bunkers #11 and #12
- PAOI 2 – Torpedo Storehouse
- PAOI 3 – North and South Gun Mounts
- PAOI 4 – Magazine Ignitor Storage Area

6.0.3 A summary of the results and conclusions for each MRS and PAOI is presented below, and summarized in Table 6-1.

6.1 Disposal Area (MRS 1)

6.1.1 The Disposal Area (MRS 1) is a 0.5 acre area which was used as a disposal area for various scrap items. Potential human receptors for MRS 1 include visitors/trespassers, clammers, and employees/researchers. Potential ecological receptors included terrestrial feeding birds and mammals as well as benthic organisms exposed to sediment. Surface soil, sediment, and subsurface soil were identified as the media of concern MRS 1. Groundwater was originally identified during the TPP and Final SS-WP as a media of concern; however, no sample could be collected due to refusal in the surface/subsurface so the groundwater sample was abandoned in accordance with the SS-WP.

6.1.2 According to programmatic and historical documentation, only MD was noted as being found historically. No MEC or MD was observed in MRS 1 during the 2008 SI field activities. The overall MEC risk is low based on the absence of an MEC source (no previous MEC findings and a single MD discovery almost 15 years ago); site characteristics, (i.e., a stable environment

with limited site access as the MRS is on an island only accessible by boat), and limited potential for and limited frequency for receptor exposure (the area is managed as a wildlife refuge).

6.1.3 Surface soil, sediment, subsurface soil, and groundwater were the only media with a potentially complete exposure pathway for human receptors in MRS 1. Groundwater was unable to be collected as discussed in Section 3.4.1; therefore, the pathway remains potentially complete. Nitroglycerin, the only explosive detected in surface soil, exceeded its human health screening criterion; therefore, the surface soil pathway is complete for human receptors within MRS 1. All remaining explosives related MC in surface soil were non-detect and reporting limits were less than human health screening levels. MQOs for sensitivity were not met for nitroglycerin in subsurface soil and sediment with respect to the associated human health screening level, consequently contamination may be present in these media at concentrations above the aforementioned human health screening level and the subsurface soil and sediment pathways remain potentially complete.

6.1.4 Surface soil and sediment were the only media with a potentially complete exposure pathway for ecological receptors in MRS 1. As noted above, nitroglycerin was detected in one surface soil sample; however, there are no appropriate ecological receptor risk screening values for this MC. Reporting limits for all non-detect explosives related MC are all lower than soil ecological screening values. For these reasons the pathway for surface soil is incomplete for ecological receptors. Explosives related MC were not detected in sediment; however, because MQOs for sensitivity were not met for six explosives in sediments with regard to ecological screening levels, contamination may be present in sediment at concentrations above the aforementioned ecological screening level and the pathway remains potentially complete.

6.2 Bunkers #11 and #12 (PAOI 1)

6.2.1 Bunkers #11 and #12 (PAOI 1) is a 0.5 acre area used for the storage of ordnance including torpedo warheads. Potential human receptors for PAOI 1 include visitors/trespassers and employees/researchers. Potential ecological receptors include terrestrial-feeding mammals and terrestrial-feeding birds.

6.2.2 According to programmatic and historical documentation, no MEC/MD was noted as being found historically (i.e. during the 1995 ASR) within the PAOI (USACE 1995, Alion 2008a, and 2008b). No DoD-related MEC or MD was observed in PAOI 1 during the 2008 SI field activities. It was documented in the ASR that the torpedo warheads were a highly classified and controlled inventory item and that there was no chance of the Navy leaving behind 326-lb warhead when they ceased warhead storage on the island. During the 2008 SI activities, the

bunkers were observed as being unsafe to enter as they had collapsed and were surrounded by debris (concrete block steel beams and vegetation). In accordance with the Final SS-WP and stakeholder agreements, no samples were collected at this PAOI due to the absence of MEC/MD or observed drainage systems. The overall MEC risk is low based on the MEC source, site characteristics restricting continual public access, and the limited potential for receptor exposure.

6.2.3 Surface soil was the only medium with a potentially complete exposure pathway for human and ecological receptors in PAOI 1. Based on the absence of a source area (no MEC/MD observed), no sampling was conducted in accordance with stakeholder agreements and the Final SS-WP. The surface soil pathway for human and ecological receptors is incomplete based on the absence of MEC/MD findings.

6.3 Torpedo Storehouse (PAOI 2)

6.3.1 The Torpedo Storehouse (PAOI 2) is an approximate 0.5 acre area used as an inert torpedo storehouse during World War II (the warheads were stored in PAOI 1). Potential human receptors for PAOI 2 include visitors/trespassers and employees/researchers. Potential ecological receptors include terrestrial-feeding mammals and terrestrial-feeding birds.

6.3.2 According to programmatic and historical documentation and stakeholders, no MEC/MD was noted as being found historically (i.e. during the 1995 ASR) within the PAOI (USACE 1995, Alion 2008a and 2008b). No MEC or MD was observed in PAOI 2 during the 2008 SI field activities. During the 2008 SI activities, the Field Team was unable to access the storehouse due to dense vegetation (sticker bushes). In accordance with the Final SS-WP and stakeholder agreements, no samples were collected at this PAOI due to the absence of MEC/MD or drainage systems. The overall MEC risk is low based on the MEC source, site characteristics restricting continual public access, and the limited potential for receptor exposure.

6.3.3 Surface soil was the only medium with a potentially complete exposure pathway for human and ecological receptors in PAOI 2. Based on the absence of a source area (no MEC/MD observed), no sampling was conducted in accordance with stakeholder agreements and the Final SS-WP. The surface soil pathway for human and ecological receptors is incomplete based on the absence of MEC/MD findings.

6.4 North and South Gun Mounts (PAOI 3)

6.4.1 The Fixed Aircraft Machine Gun Range (PAOI 3) is a two acre area located in the middle of the island. Potential human receptors for PAOI 3 include visitors/trespassers and employees/researchers. Potential ecological receptors include terrestrial-feeding mammals and terrestrial-feeding birds.

6.4.2 According to programmatic and historical documentation and stakeholders, no MEC/MD was noted as being found historically (i.e. during the 1995 ASR) within the PAOI (USACE 1995, Alion 2008a and 2008b). No MEC or MD was observed in PAOI 3 during the 2008 SI field activities. In accordance with the Final SS-WP and stakeholder agreements, no samples were collected at this PAOI due to the absence of MEC/MD or drainage systems. The overall MEC risk is low based on the MEC source, site characteristics restricting continual public access, and the limited potential for receptor exposure.

6.4.3 Surface soil was the only medium with a potentially complete exposure pathway for human and ecological receptors in PAOI 3. Based on the absence of a source area (no MEC/MD observed), no sampling was conducted in accordance with stakeholder agreements and the Final SS-WP. The surface soil pathway for human and ecological receptors is incomplete based on the absence of MEC/MD findings.

6.5 Magazine Ignitor Store House (PAOI 4)

6.5.1 The Magazine Ignitor Store House (PAOI 4) is an approximate 0.1 acre area located in the middle of the island north of PAOI 3. Potential human receptors for PAOI 3 include visitors/trespassers and employees/researchers. Potential ecological receptors include terrestrial-feeding mammals and terrestrial-feeding birds.

6.5.2 According to programmatic and historical documentation and stakeholders, no MEC/MD was noted as being found historically (i.e. during the 1995 ASR) within the PAOI (USACE 1995, Alion 2008a and 2008b). No MEC or MD was observed in PAOI 4 during the 2008 SI field activities. While performing reconnaissance of the area, it was noted that the area was completely overgrown with dense vegetation. No features associated with the former magazine (i.e. no debris or buildings) were observed. In accordance with the Final SS-WP and stakeholder agreements, no samples were collected at this PAOI due to the absence of MEC/MD or drainage systems. The overall MEC risk is low based on the MEC source, site characteristics restricting continual public access, and the limited potential for receptor exposure.

6.5.3 Surface soil was the only medium with a potentially complete exposure pathway for human and ecological receptors in PAOI 4. Based on the absence of a source area (no MEC/MD observed), no sampling was conducted in accordance with stakeholder agreements and the Final SS-WP. The surface soil pathway for human and ecological receptors is incomplete based on the absence of MEC/MD findings.

Table 6-1. Summary of Human Health and Ecological Screening-Level Risk Assessment Results.

Human Health COPCs[1]					
Medium of Concern	**MRS 1 – Disposal Area**	**PAOI 1 – Bunker Area**	**PAOI 2 – Torpedo Storehouse**	**PAOI 3 – North and South Gun Mounts**	**PAOI 4 – Magazine Ignitor Storehouse**
Sediment	No munitions related MC detected. No COPCs identified.	No sampling was completed in accordance with the Final SS-WP.	No sampling was completed in accordance with the Final SS-WP.	No sampling was completed in accordance with the Final SS-WP.	No sampling was completed in accordance with the Final SS-WP.
Surface Soil	Nitroglycerin was detected above human health screening criteria and was identified as a COPC	No evidence of MEC/MD on the surface. No sampling performed in accordance with stakeholder agreements and the Final SSWP.	No evidence of MEC/MD on the surface. No sampling performed in accordance with stakeholder agreements and the Final SSWP.	No evidence of MEC/MD on the surface. No sampling performed in accordance with stakeholder agreements and the Final SSWP.	No evidence of MEC/MD on the surface. No sampling performed in accordance with stakeholder agreements and the Final SSWP.
Subsurface Soil	No munitions related MC detected. No COPCs identified.	No sampling was completed in accordance with the Final SS-WP.	No sampling was completed in accordance with the Final SS-WP.	No sampling was completed in accordance with the Final SS-WP.	No sampling was completed in accordance with the Final SS-WP.
Groundwater	No sample could be collected due to refusal.	No sampling was completed in accordance with the Final SS-WP.	No sampling was completed in accordance with the Final SS-WP.	No sampling was completed in accordance with the Final SS-WP.	No sampling was completed in accordance with the Final SS-WP.

Ecological COPECs (SLERA)[2]					
Medium of Concern	**MRS 1 – Disposal Area**	**PAOI 1 – Bunker Area**	**PAOI 2 – Torpedo Storehouse**	**PAOI 3 – North and South Gun Mounts**	**PAOI 4 – Magazine Ignitor Storehouse**
Sediment	No munitions related MC detected. No COPECs identified.	No sampling was completed in accordance with the Final SS-WP.	No sampling was completed in accordance with the Final SS-WP.	No sampling was completed in accordance with the Final SS-WP.	No sampling was completed in accordance with the Final SS-WP.
Surface Soil	Nitroglycerin was detected however does not possess a screening criteria and was not identified as a COPEC	No evidence of MEC/MD on the surface. No sampling performed in accordance with stakeholder agreements and the Final SSWP.	No evidence of MEC/MD on the surface. No sampling performed in accordance with stakeholder agreements and the Final SSWP.	No evidence of MEC/MD on the surface. No sampling performed in accordance with stakeholder agreements and the Final SSWP.	No evidence of MEC/MD on the surface. No sampling performed in accordance with stakeholder agreements and the Final SSWP.
Subsurface Soil	No munitions related MC detected. No COPECs identified.	No sampling was completed in accordance with the Final SS-WP.	No sampling was completed in accordance with the Final SS-WP.	No sampling was completed in accordance with the Final SS-WP.	No sampling was completed in accordance with the Final SS-WP.

1 For the Human Health Risk Screen, EPA Region 1 medium specific screening levels (MSSLs) were used for soil and groundwater comparisons. See Tables 5-1 through 5-2 for the screening values.
2 For Ecological Risk Screen, the screening values identified in Table 5-4 were applied.

7. RECOMMENDATIONS FOR FURTHER ACTION

7.0.1 One MRS, MRS 1 – Disposal Area, and four PAOIs, PAOI 1 – Bunkers #11 and 12, PAOI 2 – Torpedo Storehouse, PAOI 3 – North and South Gun Mounts PAOI 4 – Magazine Ignitor Storage Area were identified at the Gould Island FUDS.

7.0.2 Based on the results and conclusions of this SI, the following recommendations are provided:

- ***MRS 1 (Disposal Area) - An NDAI designation is recommended for MRS 1*** under the FUDS MMRP**.** One inert item classified as MD (aft section of a torpedo) was discovered historically during the 1995 ASR site visit. The potential risk posed by MEC, assessed through three risk factors (i.e., presence of MEC source, accessibility or pathway presence, and potential receptor contact), is low for MRS 1 due to the absence of an MEC source (no previous MEC findings and a single MD discovery almost 15 years ago); site characteristics, (i.e., a stable environment with limited site access as the MRS is on an island only accessible by boat), and limited potential for and limited frequency for receptor exposure (the area is managed as a wildlife refuge). Nitroglycerin was detected in soil at levels exceeding human health screening criteria and was identified as a COPC which warrants further investigation. USACE has an ongoing HTRW project which encompasses MRS 1. MC, to include explosives, will be addressed during the ongoing HTRW project. Furthermore, if MEC is found at the site during a later date (i.e. HTRW investigation or other investigations), then an MMRP project may be re-opened for this MRS.[12] No COPCs were identified in sediment, and no COPECs were identified in soil or sediment at the Gould Island FUDS. MQOs for sensitivity were not met for nitroglycerin in subsurface soil and sediment with respect to the associated human health screening level, consequently contamination may be present in these media at concentrations above the aforementioned human health screening level and the subsurface soil and sediment pathways remain potentially complete. Furthermore, MQOs for sensitivity were not met for six explosives in sediments with regard to ecological screening levels; therefore, contamination may be present in sediment at concentrations above the aforementioned ecological screening levels and the pathway remains potentially complete.

[12] A communication record documenting these discussions is included in Appendix C of this SI Report.

- ***PAOI 1 (Bunkers #11 and #12) - An NDAI designation is recommended for PAOI 1***. During the 1995 and 2008 site visits, no MEC/MD was found. It was documented in the ASR that the torpedo warheads were a highly classified and controlled inventory item and that there was no chance of the Navy leaving behind 326-lb warhead when they ceased warhead storage on the island. During the 2008 SI reconnaissance activities, the bunkers were observed as being unsafe to enter as they had collapsed and were surrounded by debris (concrete block steel beams and vegetation). In accordance with the Final SS-WP and stakeholder agreements, no samples were collected at this PAOI due to the absence of MEC/MD. The overall MEC risk is low based on the MEC source, site characteristics restricting continual public access, and the limited potential for receptor exposure.

- ***PAOI 2 (Torpedo Storehouse) - An NDAI designation is recommended for PAOI 2.*** During the 1995 and 2008 site visits, no MEC/MD was found. No MEC or MD was observed in PAOI 2 during the 2008 SI field activities while performing reconnaissance around the former storehouse. During the 2008 SI activities, the Field Team was unable to access the storehouse due to dense sticker bushes. In accordance with the Final SS-WP and stakeholder agreements, no samples were collected at this PAOI due to the absence of MEC/MD. The potential risk posed by MEC, assessed through three risk factors (i.e., presence of MEC source, accessibility or pathway presence, and potential receptor contact), is low based on the MEC source (warheads stored in PAOI 1) and absence of DoD-related MEC/MD findings, site characteristics restricting continual public access, and the limited potential for receptor exposure (no past evidence of MEC/MD).

- ***PAOI 3 (North and South Gun Mounts) - An NDAI designation is recommended for PAOI 3***. No MEC/MD was noted as being found historically (i.e. during the 1995 ASR) within the PAOI. No MEC or MD was observed in PAOI 3 during the 2008 SI field activities. In accordance with the Final SS-WP and stakeholder agreements, no samples were collected at this PAOI due to the absence of MEC/MD. The potential risk posed by MEC, assessed through three risk factors (i.e., presence of MEC source, accessibility or pathway presence, and potential receptor contact), is low for on the MEC source and absence of DoD-related MEC/MD findings, site characteristics restricting continual public access, and the limited potential for receptor exposure.

- ***PAOI 4 (Magazine Ignitor Storehouse) - An NDAI designation is recommended for PAOI 4.*** No MEC/MD was noted as being found historically (i.e. during the 1995 ASR) within the PAOI (USACE 1995, Alion 2008a and 2008b). No MEC or MD was observed in PAOI 3 during the 2008 SI field activities. During reconnaissance of the area during the 2008 SI activities, no evidence of the former magazine was visible (i.e. no debris or buildings) and the area was covered in dense vegetation. In accordance with the Final SS-WP and stakeholder agreements, no samples were collected at this PAOI due to the absence of MEC/MD. The potential risk posed by MEC, assessed through three risk factors (i.e., presence of MEC source, accessibility or pathway presence, and potential receptor contact), is low for on the MEC source and absence of DoD-related MEC/MD findings, site characteristics restricting continual public access, and the limited potential for receptor exposure.

7.0.3 The boundary for MRS 1 (Disposal Area 14) presented in the ASR Supplement does not match the location of the debris field/disposal area as observed in the field and should be expanded/adjusted as necessary to encompass the entire disposal area. The ASR Supplement should be revised accordingly.

7.0.4 Neither a TCRA nor a NTCRA are recommended for MRS 1 or PAOIs 1-4 at Gould Island.

8. REFERENCES

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APPENDIX A – SCOPE OF WORK

Located on CD.

APPENDIX B – TECHNICAL PROJECT PLANNING MEMORANDUM

- Technical Project Planning Memorandum
- Technical Project Planning Memorandum #2
- Data Quality Objective Verification Worksheets

Located on CD

APPENDIX C – INTERVIEW DOCUMENTATION

McJilton, Tim

From: Mueller, Cornelia A CIV NAVFAC MIDLANT [cornelia.mueller@navy.mil]
Sent: Wednesday, May 27, 2009 7:58 AM
To: McJilton, Tim
Cc: O'Neill, Mike; Shia, Corinne M ; Cook, Thomas L CIV NUWC NWPT
Subject: RE: Surveillance at Gould Island

RIDEM does not coordinate when they visit the southern part of island. They do coordinate if they visit our end. Trespassers and fishermen have excess to the entire island and we know that the public does visit the island without our knowledge. The Navy Security folks do patrol the area, but I do not believe it is on a regular basis.

Tom: Can you provide any additional information?

Cornelia Mueller
Environmental Scientist
Installation Restoration and Contract Support
1 Simonpietri Drive
Environmental Division (PRNP4/PRR41)
Naval Station Newport
Newport, RI 02841
P 401-841-7561
DSN 948-7561
F 401-841-7071
cornelia.mueller@navy.mil

-----Original Message-----
From: McJilton, Tim [mailto:tmcjilton@eaest.com]
Sent: Tuesday, May 26, 2009 17:09
To: Mueller, Cornelia A CIV NAVFAC MIDLANT
Cc: O'Neill, Mike; Shia, Corinne M
Subject: Surveillance at Gould Island

Ms. Mueller,

Greetings. I am a member of the Alion Team under contract to USACE with the MMRP FUDS program. I was wondering if perhaps you could provide me with some information regarding surveillance at Gould Island.

In preparation of issuing the Draft Final Site Inspection report, we are trying to determine the extent of surveillance on Gould Island. I understand that the Navy does own a portion on the northern end of the island (not FUDS eligible) and RIDEM owns a portion that is currently managed as a wildlife refuge (FUDS eligible). Our field activities in December occurred on the portion owned by RIDEM in the former Disposal Area. Could you please inform me whether or not RIDEM has to coordinate with the Navy prior to accessing the island or if it is possible for trespassers and fishermen to access the island? Does the Navy currently use periodic foot patrols, guards or any other type of surveillance (i.e. video or motion sensor)?

Thank you for any information you are able to provide. It is greatly appreciated.

Timothy McJilton

Scientist

EA Engineering, Science and Technology

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ALION
SCIENCE AND TECHNOLOGY

COMMUNICATIONS RECORD FORM

Date: 8 June 2009

Contract Number: W912DY-04-D-0017

Delivery Order #'s: 00170001

Distribution: Gould Island Site Inspection (SI) Report - MMRP Project No. D01RI033803 and Blue Beach SI Report - MMRP Project No. (D01RI048802

Persons Contacted: Ms. Maryellen Iorio (CENAE), Mr. Lawrence Cain (CENAE), Heather Sullivan (CENAE), Julie Kaiser (CENAB), and Emily Devillier (CENAB)

Affiliation: USACE New England District (CENAE) and USACE Baltimore District (CENAB)

Site Addresses: Jamestown, RI

Type of Contact: Telephone Conference Call (Toll Free: 1-800-453-7412/ Passcode: 233906)

Person Making Contact: Ms. Corinne Shia. And Mr. Michael O'Neill

The Alion Team contacted member of CENAB/CENAE to discuss the response to comments for the draft SI Report for Gould Island. Specifically, Alion received comments from USACE regarding the RI/FS recommendation made for MRS 1 on Gould Island. Alion personnel indicated that the RI/FS recommendation was based on the previous findings of MD, the single exceedance of nitroglycerin in soil, and the fact that no intrusive investigations have been conducted in the disposal area (disposal area contents unknown). Alion personnel added that it is not in Alion's purview to make recommendations regarding a hazardous, toxic, and radioactive (HTRW) project.

USACE personnel stated that they do not agree with the RI/FS recommendation for Gould Island MRS 1, as there is no clear evidence that MEC is present in MRS 1, and the MC that is present can be addressed during the ongoing investigation being conducted under the HTRW project. Going forward, the HTRW investigation can/will include MC (i.e. explosives) in the investigation. USACE personnel added that the HTRW contractor will be made aware of previous MMRP SI findings and that UXO avoidance will be employed during the HTRW investigation, if deemed necessary. They noted that if MEC is found anytime during the HTRW investigation, the MMRP project will be reopened.

USACE requested that the Gould Island SI conclusions be revised to NDAI and that a footnote be added to the NDAI recommendation. Text for the footnote should include mention of the ingoing HTRW project, USACE addressing MC in the HTRW project, and the fact that the MMRP project could be reopened at a later date if MEC is found during the HTRW project.

Alion personnel indicated that the requested changes would be made and forwarded to USACE for review and approval prior to releasing the Draft Final Report to stakeholders. Alion and USACE personnel also discussed a unique cover letter for this SI. It was agreed that the letter could contain rationale for the NDAI and include a discussion of the ongoing HTRW project at MRS 1 and how future response actions would be addressed.

Alion personnel indicated that on a similar site, Blue Beach (MMRP Project No. D01RI048802) which has an ongoing HTRW project, the recommendation for MRS 1 had been changed from NDAI to RI/FS during the release of the Draft Final SI report based on recommendations from USAESCH (Walker). USACE personnel indicated that the conclusions of Blue Beach MRS 1 would have to be revised as well. The recommendation from Alion was to generate a cover letter for distribution to stakeholders explaining the rationale for the change in recommendations. It was agreed that this letter should be distributed to all Blue Beach Stakeholders immediately so that they would receive the notification prior to the second TPP.

Action Items:

1) Alion – Revise response to comments and text to include changed recommendation (change from RI/FS to NDAI for MRS at Gould Island)
2) Alion – Prepare cover letter explaining rationale for NDAI for Gould Island.
3) Alion – Prepare letter explaining rationale for switch from RI/FS to NDAI for Blue Beach to be sent to stakeholders.

APPENDIX D – FIELD NOTES AND FIELD FORMS

- Daily Quality Control Reports
- Field Forms
- Logbook
- Chain of Custody

Alion Science and Technology, Inc.

DAILY QUALITY CONTROL REPORT

Report Number:	12-09-08-01	**Date:** 12-09-08	
Project Name:	Gould Island D01RI033803	**Contract Number:** W912DY-04-D-0017	
Location of Work:	Gould Island/Jamestown, Rhode Island		
Description of Work:	Meandering path geophysical reconnaissance and sampling.		

Weather:	Sunny/overcast , Cold	**Rainfall:**	none	**Temperature:**	**Min.**	28	**Max.** 50
							Wind Chill = none

1. Work performed today by Alion Team.

The field team (Tim McJilton, Mike O'Neill and John Healy) arrived at the Rhode Island Department of Environmental Management (RIDEM) Marine Police Marina (150 Fowler Street) at 8:30 am. A health and safety briefing was conducted with field personnel who reviewed the proposed field activities and health and safety concerns. The field team met with RIDEM personnel who escorted them to a vessel for transport to Gould Island. Prior to mobilizing to sample locations, the field team loaded equipment and were briefed by RIDEM personnel about accessing Gould Island. Once on the Island the field team performed MEC avoidance and reconnaissance (meandering paths) to access the proposed sample locations. Once at the sample location, the sampling area was screened with a magnetometer for any MEC, and the samples were collected.

Reconnaissance Acreage / Discussion:

Reconnaissance was conducted in the meandering path fashion. Travel paths varied from the geophysical site reconnaissance figures in the SS-WP due to natural terrain, access issues (dense vegetation with thorny brush surrounding MRS 1and the PAOI).

Samples Collected:

GI-DA-SD-02-01*	GI-DA-SS-02-02	GI-SB-DUP 1
GI-DA-SD-02-02	GI-DA-SS-02-03	GI-SD-DUP 1
GI-DA-SS-02-01*	GI-DA-SB-18-02*	GI-SS-DUP 1

***** Samples associated with Field Duplicates

Field Tests:

Trimble GPS unit along with two additional handheld Garmin units were checked against the benchmark [Gould Island South Light on the southern tip of Gould Island). The benchmark was assigned coordinates Northing 4600188.731 and Easting 304447.337. The Trimble GPS unit measured coordinates Northing 4600188.731 and Easting 304447.337. The Trimble measured 4600183.85, 304442.50 and the Garmin unit measured 4600186, 0304441. Units were set up in UTM_Zone_19N_Meters. The variation noted was associated with the heavy vegetation surrounding the benchmark and the cloudy conditions. All GPS units were checked during reconnaissance activities and determined to be working properly and the field team proceeded to the sampling site. Measurements were noted in relation to certain objects as well.

Calibration of Instruments:

None.

Other:

None.

2. Work performed today by other subcontractors.

None

3. Type and results of Control Phases and Inspection. (Indicate whether Preparatory – P, Initial – I, or Follow-Up – F and include satisfactory work completed or deficiencies with actions to be taken)

Preparatory phase inspections for field work were completed prior to mobilizing to Gould Island in Jamestown, Rhode Island. A follow-up inspection of equipment was completed upon arrival in Jamestown (12-07-08) and the Schonstedt, GPS, and other equipment was determined to be operable. Satisfactory work was completed.

4. List type and location of tests performed and results of these tests.

None

5. List material and equipment received.

None.

6. Submittals reviewed. (Include Transmittal No., Item No., Spec/Plan Reference, by whom, and any action.

None.

7. Off-site surveillance activities, including action taken.

None.

8. Job Safety. (Report safety violations observed and actions taken)

No safety violations or incidents.

9. Remarks. (Instructions received or given. Conflicts in Plans or Specifications)

The field team (Tim McJilton, Mike O'Neill and John Healy) arrived at the Rhode Island Department of Environmental Management (RIDEM) Marine Police Marina located at 150 Fowler Street at 8:30 am. A health and safety briefing was conducted with field personnel who reviewed the proposed field activities and health and safety concerns. The field team met with RIDEM personnel who escorted them to a vessel for transport to Gould Island. According to Marine Police personnel low tide was predicted to be around 10:25 am. The boat left the marina around 9:00 am and arrived on Gould Island around 9:25 am. The field crew unloaded at the old seaplane ramp at the southern end of Gould Island and waded to shore with the equipment.

The Field Team performed benchmark validation on site then proceeded along the western beach/shoreline to Disposal Area 14 to begin sampling. The field team performed reconnaissance along the beach from the seaplane ramp up to the disposal area and all around the disposal area. The disposal area was observed during low tide. The low tide revealed a rock covered beach about 25-30 feet in width at the widest point in front of the disposal area. The debris field associated with the disposal area extended as far as 10-15 ft from the toe of the cliffs west toward the ocean, but the majority of the debris was concentrated within the first 6-8 ft of beach beyond the toe of the cliff. The length of the debris field along the beach was about 100 ft (from north to south), with the northern most point being adjacent to the former incinerator (Building 49) and the southern point being several feet north of the small boat landing. GPS coordinates were collected to be able to map the debris field in the SI Report. The height of the fill and vegetation covered disposal area rises about 20-30 feet from the beach and it extends about 20-40 feet east to the edge of a former roadway. It is unclear if the entire area is 100 percent disposal area but debris was noted at the ends and all along the tree and thorn bush covered surface of the area during reconnaissance. This majority of the area is covered in dense vegetation/fill but debris is evident on the surface and along the cliff (ocean side) as the fill erodes. The majority of the items observed were rusted steel and iron along with concrete (large anchor blocks and broken concrete with rebar), tires, cables and wires, cans, asphalt, etc. The pieces of rusted metal ranged in size from small bolts/screws up to large pieces of rusted

equipment. Small chunks of greenish material (thought to be oxidized copper melted with other metal and rock) were observed along the toe of the disposal area in several spots. Engine parts and piping were common in the beach debris field and several areas of dried black material containing metal parts were observed. Given the appearance of the dried/solid material (color, odor, texture) it was thought to be dried tar. No MEC or MD was observed. The field team compared the ASR photographs/ reconnaissance information to the field conditions and found the approximate spot that the ASR team had identified the MD (remnants of the aft end of a Torpedo including a shaft and propeller). The team located the other objects in the ASR photograph, but there was no evidence of the torpedo debris. Given the size and weight of the torpedo debris which appeared to be similar to the other objects in the photo, the field team speculated that the item had to have been removed by someone not washed away (i.e. the similarly sized/weighted items surrounding the torpedo were still present and not washed away or moved). The field team located an area with less brush (down near the small boat landing) and scaled the cliff up to the top of the debris field. The field team located the former roadway and walked along the roadway stopping to venture into the debris field at various points. Given the dense vegetation access was limited in most spots to about 10-15 ft from the road. Items observed included numerous drums, asphalt, cables, concrete, engine parts, suspect incinerator ash, rusted metal, tires, etc. The team traveled back to the beach and began sample collection.

No low lying areas beyond the reach of high tide were noted; therefore, the two sediment samples were collected along the tow of the landfill in areas which were wet from tides/wave action. The material collected was sandy/soil material. Debris including nails, screws, and cobbles were removed from the sample material prior to collection. GPS readings were collected. The field team began augering to collect a groundwater sample. Given the site conditions (rise of 20-30 ft on the eastern side of the dump) the only option was to attempt the collection of a groundwater sample along the beach. The field team surveyed the beach and determined the southern end of the disposal area was the only location to attempt a groundwater sample (northern end was covered in cobles large and small). The field team augered four separate locations getting down to about 4 ft below ground surface in one location before refusal and only 2.0 to 3.0 ft below the surface in the other locations. Refusal was determined to be associated with large cobbles below the sandy/sediment surface material. In the deeper boring, the soil was observed to contain a thick oily like coating from around 2.5 feet down to 4ft. A strong petroleum odor was noted. No groundwater was encountered in any of the borings so no groundwater sample could be collected and the field team notified the Alion PM of the deviation from the work plan due to site conditions.

The field team moved to the top of the landfill and began collecting surface soil samples. The team selected locations where they could get closer to the edge of the cliff in the debris field. The field team observed evidence of disposal below 4-6 inches including soil with debris and rusted metal flakes. Minimal cover including soil and cobbles was observed to be on top of the debris in some locations, while there appeared to be no cover in other locations as debris was evident on the surface. Four to five locations were tried and it was determined that the field team could not get below 22 inches due to large debris items or rock covering. The field team broke one auger pole and damaged several auger heads attempting to collect samples. The field team notified the Alion PM of the site conditions (offsetting of each boring 4-5 times in each location with no boring advancing beyond 22 inches) and proposed a deviation from the work plan and collection of surface soil samples from the first 16-22 inches which would be representative of surface soil/landfill contents. The team collected two surface soil samples, one at the northern end and one at the southern end. Samples were collected at 18-22 and 16-20 inches below ground surface. Given the site conditions the field team again contacted the Alion PM and suggested switching one subsurface soil sample for a surface soil sample. The field team collected the third surface soil sample in the top of the landfill. The field team moved back to the beach to the location of the 4ft boring. A subsurface soil sample was collected from this location at approximately 3-4 ft below ground surface. No MEC or MD was observed around any sampling location. Anomalies attributable to cultural debris (metal landfill debris on the surface and observed in the subsurface) were noted around each sample location.

Next the field team performed reconnaissance around the Potential Areas of Interest (PAOI 1: Bunker Area [Warhead Storage Bunkers 11 and 12], PAOI 2: Torpedo Storehouse, PAOI 3: Gun mounts, and PAOI 4: Magazine Ignitor Storage Area). The field team performed reconnaissance around the PAOI 3: Gun mounts. Vegetation was extremely dense making travel slow and access limited. Evidence of the former mounts were located near the mapped locations. Evidence observed included reinforced concrete debris and electric

poles. No evidence of MEC/MD was observed. Anomalies attributable to reinforced concrete were noted. An empty bunker type structure was located to the east of the southern gun mount. A rusted out empty drum was located at the entrance to the bunker, but no evidence of MEC/MD was observed. The former water storage tank was noted to have collapsed and an empty suspect fuel oil storage tank (rusted/disintegrated) was noted to the west of both gun positions.

Next the team traveled towards PAOI 4: Magazine Ignitor Storage Area. The field team could not access the area from the roadway (overgrown) or the shoreline due to the extremely dense vegetation (thick thorn covered bushes with dense brush).

Next the team proceeded to the PAOI 1: Bunker Area (Warhead Storage Bunkers [Bunkers 11 and 12]). The field team traveled around the shoreline and then proceeded from the shore to Bunker # 12 first. The entrance was overgrown with dense vegetation blocking the entrance and hanging down into the entrance. It was observed to be completely collapsed with building debris blocking the entrance and hanging down into the entrance. The field team determined that safe access could not be gained into the bunker. No Evidence of MEC or MD was noted within the bunker building debris. The field team traveled back the shoreline and then proceeded from the shore up towards Bunker # 11. The entrance was overgrown and after some effort the team was able to enter the entranceway of the bunker. The bunker was completely collapsed with debris from the walls (clay block) and steel beams and suspect drums lying in a pile. The floor of the bunker was not observed as the wall and ceiling debris covered the entire area. The team took several photos but they were unable to walk around in the debris due to safety issues. No Evidence of MEC or MD was noted within the bunker building debris. The field team traveled back the shoreline and then proceeded from the shore up towards the seaplane ramp and former storage hangar (wiped out by a former hurricane). Next the team traveled towards PAOI 2: Torpedo Storehouse. The field team could not access the area from the seaplane landing area (overgrown) or the shoreline due to the extremely dense vegetation (thick thorn bushes and dense brush).

The RIDEM Marine Police returned to the site to pick up the field team. The field team loaded the gear on the boat at 1540 and returned to the dock around 1620.

Deviations from the work plan included minor adjustments to sample locations due to site conditions (topography, vegetation and findings of debris). Photographs were taken of sampling locations and areas of interest throughout the FUDS (*i.e.* dumpsites, buildings, site conditions, etc.). GPS coordinates were recorded for sample and debris locations. Samples were later recorded on lab specific Chain of Custody forms, placed on ice, and shipped to the lab. No health and safety issues and/or incidents occurred during field work. No MEC or MD was found.

Alion Science and Technology, Inc's Verification: On behalf of Alion, I certify this report is complete and correct, and all materials and equipment used and work performed during this reporting period are in compliance with the contract plans and specifications, to the best of my knowledge, except as noted above.

Quality Control System Manager (Sign and Print Name)

TAILGATE SAFETY MEETING FORM

Date: 12.5.08 Time: 0730 Job Number: _____

Client: USACE

Site Location: GOULD ISLAND

Scope of Work: UXO AVOIDANCE

SAFETY TOPICS PRESENTED

Protective Clothing/Equipment: COLD WEATHER clothing to include wet weather clothing

Chemical Hazards: _____

Physical Hazards: SLIPS, TRIPS, FALLS, DROWNING

Special Equipment: LIFE VESTS

Other: UXO, WATER, SEAS, BOATING HAZARDS

Emergency Procedures: PHONE FISH AND WILDLIFE

Hospital: _____ Phone: _____ Ambulance Phone: _____

Hospital Address and Route: _____

ATTENDEES

NAME PRINTED	SIGNATURE
John Hensley	
Michael O'Neill	
Tim McJilton	

Meeting Conducted By: John Hensley / _____
Name Printed Signature

Site Safety Officer: _____

ACCIDENT PREVENTION PLAN REVIEW RECORD

SITE: Gould Island MMRP SI

Project No. 62023.06

I have read the Accident Prevention Plan and have been briefed on the nature, level, and degree of exposure likely as a result of participation of field activities. I agree to conform to all the requirements of this Plan.

Name	Signature	Affiliation	Date
Tim McSilter		EA Engineering	12-9-08
Michael O'Neill		EA Engineering	12-9-08
John Hanley		HHA	12.9.08

SITE ENTRY AND EXIT LOG

Project/Site : Gould Island
Project No.: G20230 6

Date	Name	Representing	Time In	Time Out
12-9-08	Tim McSilta	EA Engineering	0830	1630
12-9-08	Michael O'Neill	EA Engineering	0830	1630
12-9-08	John Healey	HPA	0830	1630

HEALTH AND SAFETY ACTIVITY REPORT

Site: Gould Island Location: Jamestown, Rhode Island

Weather Conditions: Cold 30's – 40's Onsite Hours: From 8:30 To 16:30

Morning Briefing Topic: Cold Stress, UXO Avoidance, boating Safety tripping / Falling hazards

General Activities Complete: Collected Samples and performed reconnaissance around island

Morning Briefing Attendance: Michael O'Neill Tim McJilton John Healy

Changes in PPE Levels*	Work Operations	Reasons for Change
NONE – Worked in Level D		

Site Safety and Health Plan Violations	Corrective Action Specified	Corrective Action Taken (yes/no)
NONE		

Observations and Comments:
NONE

Completed by: Michael O'Neill Date: 12/9/08

EA Site Health and Safety Supervisor

*Only SSHO may change PPE levels, using only criteria specified in Programmatic APP.

"Rite in the Rain"®
ALL-WEATHER WRITING PAPER

ALL-WEATHER
ENVIRONMENTAL FIELD BOOK

Name Tim McTilton

Address 15 Loveton Circle
Sparks MD 21052

Phone 410-771-4950

Project MMRP FUDS Site Inspection of Gould Island
MMRP Project # D01RI033803
Qc'd by: Michael O'Neill

This book is printed on "Rite in the Rain" All-Weather Writing Paper - A unique paper created to shed water and enhance the written image. It is widely used throughout the world for recording critical field data in all kinds of weather. For best results, use a pencil or an all-weather pen.

Specifications for this book:

Page Pattern		Cover Options	
Left Page	Right Page	Polydura Cover	Fabrikoid Cover
Columnar	1/4" Grid	Item No. 550	Item No. 550F

CONTENTS

Reference Page Index

CONTENTS

PAGE	REFERENCE	DATE
12/8/08	After finalizing the WP, RIDEM sent an email/letter clarifying their requests in regards to Sampling depth within MRS1. RIDEM Requested that Alion relocate borings until the desired boring depth for Surface & Subsurface samples can be achieved (relocate if refusal encountered). RIDEM Requested that GW samples be collected with a bailer instead of via the slow purge method. RIDEM requested that USACE conduct reconnaissance & collect samples in each PAOI.	
	– Had to use pencil as pens are frozen	
12/9/08	0830	
	– Conducted tailgate safety briefing. Signed Forms	
	– Loaded boat & head to Gould Island	

Location Gould Island SI Date 12/9/08

Project / Client USACE / Alion

0900 Field Team Depart Boat launch area at 150 Fowler St. in Wickford RI. RIDEM Environmental Police are the escort to the Island. M. O'Neill, T. McSilton & S Healey are present for the Site Inspection. Weather - cloudy, cold, 28 degrees.

0925 Field team Arrives at Gould Island, unloads boat and prepares for the days sampling activities. RIDEM, ENV. Police depart site. Will return later in day to transport team back to Shore. Field team was dropped off South of MRS1 at the old Seaplane ramp. 100-105 pics 106- Torpedo Cart

0955 T.M. checks GPS unit Coordinates at Tower on Southern end of Island.

Trimble - 4600183.85 mN pic 107
304442.50 mE

Garmin I - 4600186 mN
0384441 mE

Location GOULD ISLAND Date 12/9/08

Project / Client USACE / ALION

TMG JM

Garmin 2- 4600184mN
0304440mE
Low tide @ 10AM?

Field Team walked up the western side of the ISLAND from the old sea plane Ramp to the former incinerator. Piles of debris were observed along the shoreline (everywhere)
* PICS 108 - 117
Some observations starting from the Northern end of the debris field near the incinerator. About 15 (≈80 ft) of concrete (6 X 6 X 4 Blocks) Blocks for Anchoring ships. PICS 118-130
- Debris behind concrete blocks including incinerator ash/debris, rusted metal, broken concrete, etc.

* → MK12 - Top of debris field along shore 4600685.62 / 304292.71 Coordinates
GPS MARK

Location GOULD ISLAND Date 12/9/08

Project / Client USACE / ALION

TMG JM

* MK13 4600646.3 / 304297.8 TAR / metal / parts
PICS 132 - 134 end of Concrete blocks
Slopes are Cliffs. About 20-30 ft up from toe of beach/shore and cliff. Covered in vegetation / steep slopes.

* MK14 4600629.4 / 304294.7
Black Asphalt Shingles observed with Concrete Blocks / Concrete debris Rusted Metal / engine parts/pipes etc. PICS 135 - 140 139 (TMG)

* MK15 4600619.7 / 304298.12
TAR / Pipe / Flanges / engine Block Motor / gears (within Debris tidal zone) 25 - 35 ft up from toe of shore to top of debris cliff. Metal / debris coming from Cliff.

6

Location GOULD ISLAND SI Date 12/9/08

Project / Client USACE / Alion

Tues Jan

* MK16 - Large Metal container boiler ?? 4600608.2 / 304298.4
Debris everywhere. PIC 140-141 Drum
PICS. 142-157 Debris

* MK17 - End of debris field Near Small boat dock (Southern End)
4600572.6 304307.6
MARKed debris

MK18 Small Boat dock/pier + Small Building (Southern end)
MJO ~~4600559.3~~ 304312.8
4600559.3

* 11:45 MK19 - GPS Marking
4600624.6 304299.06

* Collected Sediment Sample GI-DA-SD-02-01
Collected Gould Island SD DUP#1
(Duplicate of GI-DA-SD-02-01)
Evidence of Debris Surrounding the sampling location. Moist soil High tide zone. PIC 167-168

7

Location GOULD ISLAND SI Date 12/9/08

Project / Client USACE/ALION

Tues Jan

MK20 4600646.4 / 304298.7
304298.7

* 11:55 Collected GI-DA-SD-02-02
PIC 169-170.
- Area covered with metal
- Scrap / engine parts / screws + Nails present in Sediment (observed on the surface + in the subsurface)
- Sediment is rocky. Area along beach in High tide zone at base of cliff / Contains Sediment / subject to erosion.
PIC 171-172- Top of cliff in NRS near pier.

* 12:36 Collected Surface Soil Sample
debris on surface + in material / Asphalt / Rocks / metal / rust
dark soil - offset 2 times
GI-DA-SS-02-01
4600606.72 N
3043260.13 E
MK21 18-22in bgs
Collected Dup of SS-02-01 (SS DUP#1)

1310 Collected Surface Soil Sample
Broke Auger Pole / twisted caught in debris
MK22 Dark soil / Asphalt Shingle or tar oily soil / Metal / Rust
4600643.04 / 304321.51 (16-20in BGS)
offset 3 times before hard to get to depth PIC 176-
GI-DA-SS-02-02

Location GOULD ISLAND Date 12/9/08

Project / Client USACE / Alion

Attempting to collect Subsurface Sample
Could not get Sample - Surface debris / Large Rocks
Cables / pipes. Relocated.

* MK23 - Had to relocate again Could Not get down Through Surface Material past / below 10 inches. Refusal 8 times. Relocated different times. Relocated to Suitable Location

* TIME: 1345 Collected Sample as MK24 SS (Surface Soil)
16"-20" BGS 4600624.8
GI-DA-SS-02-03 3043222.15
Surface debris cables / grey / rusty soil & Wood. Overgrown area & Mounded areas surround Sample location. PICS 177-179

Time: 14:05 Subsurface Sample
* MK25 0304309 - Moved to back to collect subsurface sample
4600591
Collected GI-DA-SB-04-01
Refusal beyond 4ft NO GW encountered - Oily Material with ODOR. PICS 158-165
16"-18" thick about 2.5ft bgs.

Location GOULD ISLAND SE Date 12/9/08

Project / Client USACE Alion

NO GW SAMPLE Collected
(Discussed on page 11)

* Recon of Island (PAOI's) by UXO Tech/MSO

PAGE #3 → MK26 Traveled to suspect GUN MOUNT Location concrete debris NO evidence of MEC/MD PIC 186

MK27/28 BUNKER - South of suspect GUN Mount w/ DRUM in entrance. PIC 187-188 Traveled north towards the Northern GUN Mount

MK29 Water Tower debris & Oil Tank / empty observed with building debris to be rusted out PIC 190-191
- SAW a Bldg (#62).
- 62 + other Bldgs overgrown with stickers/heavy vegetation - did not inspect

MK30/31 Suspect GUN Mount (North) Approx Location. Broken Concrete w/ rebar observed
Suspect Concrete footer. NO MEC/MD observed. No Evidence of GUN platform

10

Location GOULD ISLAND SI Date 12/9/08

Project / Client USACE / ALION

TMS JM

TRAVERSED overgrown area looking for MK 32 Magazine Ignitor Storage Area PAOI #4 Marked Debris / Furthest Location North. Vegetation too heavy NO access + NO evidence of MEC/MD during travels. No Photos of vegetation

PAOI #1

MK #33 (#12) Bunker 12 - Collapsed Not Safe to Enter PIC 192-196

- NO MEC/MD observed. Bunker Collapsed

MK #34 Bunker 12 - entranceway

Traveled to next bunker.

MK #35/36 (#11) Bunker 11 - observed to be overgrown.

- went into Bunker 11 but it was completely collapsed + dangerous to walk around

NO evidence of MEC/MD.

+ Completed reconnaissance NO MEC/MD so NO SAMPLING in PAOI'S

+ Returned to Sea Plane ramp. PICS 197-202

11

Location GOULD ISLAND SI Date 12/9/08

Project / Client USACE ALION

TMS JM

PAOI #2

+ Could not access Torpedo Storehouse as the area around it is completely overgrown.

MRS1 - Ground water sampling could not be completed. the Area in front of the DA/ Landfill was traversed and one area was located along the Southern end of the landfill to try and collect a groundwater sample. DA-14 extends into the water along most of its existence so only the Southern end could be accessed. The Alion team tried to hand auger down to groundwater. FOUR attempts were made in different locations but we could not get below 3 ~~4~~ ft. Refusal from cobbles / rocks debris, etc. No GW sample collected.

Location Gould Island SI Date 12/9/08

Project / Client USACE / ALION

15:40 Team loaded RIDEM MARINE POLICE Boat & Left for Shore.

16:20 Arrived back at dock & offloaded gear.

16:30 Leaving Site.

General Notes:

PAOI #1 – Bunkers 11 + 12

Entrances intact but both bunkers were collapsed. Bunker # 12 was not safe to enter as debris blocked the entrance - some of which was ready to fall if moved. Team identified Bunker 12 as a safety hazard & did not enter. Bunker #11 as previously noted was collapsed but the entrance was accessible. The team could not walk around in the debris field as there were tripping hazards & slick surfaces impeding access past the entrance. Debris observed included

Location Gould Island SI Date 12/9/08

Project / Client USACE / ALION

drums, brick/block, steel beams, vegetation in Bunker #11 and brick/clay block steel beams & vegetation in Bunker #12. As indicated NO evidence of MEC/MD or a drainage system / drain were observed.

PAOI #2 Torpedo Storehouse –

The field team tried to access this area, but the vegetation surrounding this area was too dense & access was denied. No evidence of access to the building was observed. No MEC or MD was observed in the vegetation surrounding the building.

PAOI #3 North & South Gun Mounts

The area surrounding the southern gun mount was very dense but animal trails (likely deer) and some open areas allowed for access to the location of the former gun mount. An old electric

Location GOULD ISLAND ST Date 12/9/08

Project / Client USACE / ALION

TMG

pole + SUNKEN area w/ concrete debris was the only evidence of past use of the area. No evidence of drains, MEC or MD were observed. A concrete structure, thought to be a bunker was observed east of the suspect gun position. The bunker was observed to be empty. A small drum (empty) was observed outside the bunker. The bunker was built into the hillside. The group traveled down and UP a hill. The area around the Northern gun position was observed to be overgrown with limited access following animal trails (deer) + some areas with less vegetation. Concrete (reinforced) was observed. No structures were observed + NO MEC/MD or drains were observed.

PAOI #4 - TEAM traveled to location of the Magazine Igniter Storage Area and determined the area was completely overgrown. The team made several

Location Gould Island ST Date 12/9/08

Project / Client USACE / ALION

TMG

Attempts to access the location for the former MAGAZINE, but NO evidence of a magazine was observed (i.e. NO debris, buildings, etc). No MEC or MD was observed.

Soil SAMPLING - Soil sampling in the area of the former disposal area was extremely difficult. Debris was present at the surface & in the subsurface to include metal, ASH, SLAG, cables, roots, GLASS cement/roofing material, etc. Boring were relocated multiples times with little success. TEAM notified Alion PM after breaking equipment & then sample would be collected no deeper than 22 inches.

Sediment SAMPLING - Conducted along the coast at the toe of the disposal area in the tidal zone (area under water during high tide). Debris including greenish material (oxidized copper + melted metals + rock), dried tar, screws, steel, concrete, etc. in the area near Samples

GPL LABORATORIES, LLLP

7210A Corporate Court
Frederick, MD 21703
(301) 694-5310
Fax (301) 620-0731

Contract #/Billing Reference

of Pgs.

Project: Gould Island
Client: USACE / Alion
Send Results To: Corinne Shia
Address: 3975 Fair Ridge Dr. suite 255
Fairfax VA 22033
Phone:

Turnaround Time: STANDARD
# of Containers: 18
Container Type: 8oz glass
Preservative Used: —
Type of Analysis: Explosives 8330A / 8330A MOD / 8330A MOD

Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	Explosives	Lab Cooler No.	CLIENT COMMENTS
GI-DA-SS-02-01	12-9-08	1236	SS	MJO	X		RDX, HMX
GI-DA-SS-02-02		1310	SS	MJO	X		2,4,6 TNT
GI-DA-SS-02-03		1345	SS	MJO	X		1,3,5, Trinitrobenzene 1,3 DNB
GI-DA-SD-02-01		1145	SD	MJO	X		2,4 DNT 2,6 DNT
GI-DA-SD-02-02		1155	SD	MJO	X		4-Amino 2,6 DNT 2 Amino 4,6 DNT
GI-DA-SB-01		1405	SB	TM	X		2-Nitrotoluene 3-Nitrotoluene
GI-SB-DUP1		—	SB	TM	X		4-Nitrotoluene
GI-SS-DUP1		—	SS	MJO	X		NB. Tetryl
GI-SD DUP1		—	SD	MJO	X		PETN NG.

Relinquished By:	Date/Time	Received By:	Relinquished By:	Received for Laboratory By:	Date/Time
Michael O'Neill	12-10-08 1140				

Relinquished By:	Date/Time	Received By:	Date/Time	Shipper:	Airbill No.:

Relinquished By:	Date/Time	Received By:	Lab Comments:	Temp:

 G.P. W.O. _____

APPENDIX E – PHOTO DOCUMENTATION LOG

APPENDIX E - PHOTOGRAPHIC LOG

Project/Site: MMRP SI for Gould Island
Project No.: D01RI033803

Date	Photo ID	Description
12-9-08	E.1	View of MRS 1 (Disposal Area) from Narragansett Bay approaching the drop off point.
12-9-08	E.2	View of the navigational marker on the southern end of Gould Island next to the old sea plane ramp where GPS units were verified as working properly.
12-9-08	E.3	View looking north in MRS 1 (Disposal Area). Note: The beach area was cluttered with various metal debris, concrete, building materials and tar deposits.
12-9-08	E.4	View looking south towards the small pier from MRS 1 (Disposal Area). Note: The beach area was cluttered with various metal debris, concrete, building materials and tar deposits.
12-9-08	E.5	View of suspected area (based on review of photographs) where the aft torpedo propeller/shaft assembly was found during the ASR site visit. Note: the Field Team searched the entire MRS and no evidence of the torpedo was found.
12-9-08	E.6	View of concrete blocks used for anchoring ships. Note: About 15 of these blocks were noted and spanned roughly 80 feet. The blocks measured approximately 6x6x4 feet in size.
12-9-08	E.7	Unidentified motor part found in the beach area of the Disposal Area.
12-9-08	E.8	View of large debris pile in the tidal area of MRS1 (Disposal Area). Note: Black tar was covering a small portion of the pile which is visible on the right side of the photo.
12-9-08	E.9	View of small pile of hardened tar found on the beach area of MRS 1 (Disposal Area). Note: there were many of these small piles scattered throughout the MRS.
12-9-08	E.10	View of engine debris found within MRS 1 along the beach.
12-9-08	E.11	View of the proposed groundwater sample location. Note: After four attempts at auguring different locations, the groundwater sample was abandoned due to refusal from metal debris and cobble. The subsurface soil sample (GI-DA-SB-04-01) was collected in this location.
12-9-08	E.12	View of ground material from auguring for groundwater. Note: This material was rock and wet, greasy black material which had an odor of old fuel/oil. This material after being exposed to the air would gradually harden.
12-9-08	E.13	View of sediment sample location GI-DA-SD-02-01. Note: A field duplicate was also taken from this location.
12-9-08	E.14	View of the incinerator building located adjacent to (north of) the Disposal Area (MRS 1).
12-9-08	E.15	View of sample collection for surface soil sample GI-DA-SS-02-02. Note: groundcover typical of all samples in MRS 1 (Disposal Area). Soil was dark in color and had traces of asphalt, rock, metal and rust.
12-9-08	E.16	View of crushed drum marked “lube oil” found on top of the hill above the beach within MRS 1 (Disposal Area).

Date	Photo ID	Description
12-9-08	E.17	View of pile of drums located within MRS 1 in the same vicinity as those marked with “lube oil”. All drums were empty.
12-9-08	E.18	View of suspected area of the former southern Gun Mount (PAOI 3).
12-9-08	E.19	View of bunker located in the southern gun Mount Area (PAOI 3). The suspect gun mount is located right of the bunker.
12-9-08	E.20	View of water tower area. The leg of the former water tower is in the lower right corner. The debris pile is suspected to be the former pump house building.
12-9-08	E.21	View of rusted out oil tank (empty) located within the area of the former water tower.
12-9-08	E.22	View looking into the former Bunker #12 in PAOI 1. Note: The bunker had completely collapsed and conditions were unsafe to enter.
12-9-08	E.23	View of former Bunker 11 (now collapsed) in PAOI 1. Note: The bunker had completely collapsed and conditions were unsafe to enter.
12-9-08	E.24	View of the Torpedo Store House (PAOI 2) approaching Gould Island.
12-9-08	E.25	Typical view of the vegetation (dense brush and thorn bushes) that surround the area near the former Torpedo Store House (PAOI 2) and the former Magazine Ignitor Storage Area (PAOI 4).
12-9-08	E.26	Torpedo cart observed by the Field Team near the former seaplane ramp on the southern end of Gould Island.

Photo E.1 – View of MRS 1 (Disposal Area) from Narragansett Bay approaching the drop off point.

Photo E.2 – View of the navigational marker on the southern end of Gould Island next to the old sea plane ramp where GPS units were verified as working properly.

Photo E.3 –View looking north in MRS 1 (Disposal Area). Note: The beach area was cluttered with various metal debris, concrete, building materials and tar deposits.

Photo E.4 – View looking south towards the small pier from MRS 1 (Disposal Area). Note: The beach area was cluttered with various metal debris, concrete, building materials and tar deposits.

Photo E.5 – View of suspected area (based on review of photographs) where the aft torpedo propeller/shaft assembly was found during the ASR site visit. Note: the Field Team searched the entire MRS and no evidence of the torpedo was found.

Photo E.6 –View of concrete blocks used for anchoring ships. Note: About 15 of these blocks were noted and spanned roughly 80 feet. The blocks measured approximately 6x6x4 feet in size.

Photo E.7 – Unidentified motor part found in the beach area of the Disposal Area.

Photo E.8 – View of large debris pile in the tidal area of MRS1 (Disposal Area). Note: Black tar was covering a small portion of the pile which is visible on the right side of the photo.

Photo E.9 – View of small pile of hardened tar found on the beach area of MRS 1(Disposal Area). Note: there were many of these small piles scattered throughout the MRS.

Photo E.10 – View of engine debris found within MRS 1 (Disposal Area) along the beach.

Photo E.11 – View of the proposed groundwater sample location. Note: After four attempts at auguring different locations, the groundwater sample was abandoned due to refusal from metal debris and cobble. The subsurface soil sample (GI-DA-SB-04-01) was collected in this location.

Photo E.12 – View of ground material from auguring for groundwater. Note: This material was rock and wet, greasy black material which had an odor of old fuel/oil. This material after being exposed to the air would gradually harden.

Photo E.13 – View of sediment sample location GI-DA-SD-02-01. Note: A field duplicate was also taken from this location.

Photo E.14 – View of the incinerator building located adjacent to (north of) the Disposal Area (MRS 1).

Photo E.15 – View of sample collection for surface soil sample GI-DA-SS-02-02. Note: groundcover typical of all samples in MRS 1(Disposal Area). Soil was dark in color and had traces of asphalt, rock, metal and rust.

Photo E.16 – View of a crushed drum marked "lube oil" found on top of the hill above the beach within MRS 1 (Disposal Area).

Photo E.17 – View of pile of drums located within MRS 1 (Disposal Area) in the same vicinity as those marked with "lube oil". All drums were empty.

Photo E.18 – View of suspected area of the former southern Gun Mount (PAOI 3).

Photo E.19 – View of bunker located in the gun Mount Area (PAOI 3). The suspect southern gun mount is located right of the bunker.

Photo E.20 – View of water tower area. The leg of the former water tower is in the lower right corner. The debris pile is suspected to be the former pump house building.

Photo E.21 – View of rusted out oil tank (empty) located within the area of the former water tower.

Photo E.22 – View looking into the former Bunker #12 in PAOI 1. Note: The bunker had completely collapsed and conditions were unsafe to enter.

Photo E.23 – View of former Bunker 11 (now collapsed) in PAOI 1. Note: The bunker had completely collapsed and conditions were unsafe to enter.

Photo E.24 –View of the Torpedo Store House (PAOI 2) approaching Gould Island.

Photo E.25 – Typical view of the vegetation (dense brush and thorn bushes) that surround the area near the former Torpedo Store House (PAOI 2) and the former Magazine Ignitor Storage Area (PAOI 4).

Photo E.26 – Torpedo cart observed by the Field Team near the former seaplane ramp on the southern end of Gould Island.

Photo E.27 – View of the aforementioned bunker in Photograph E-19 (PAOI 3). The floor at the entrance of the bunker was covered in leaves however the inside of the bunker had a bare concrete floor and there were no evidence of drains however cultural debris was noted on the floor.

APPENDIX F – ANALYTICAL DATA

- Automated Data Review Library
- Automated Data Review EDDs
- EDMS
- Analytical Summary Reports
- Analytical Data Reports
- SEDD Deliverable

Located on CD.

APPENDIX G – ANALYTICAL DATA QUALITY ASSURANCE/ QUALITY CONTROL REPORT

- Validated Data from EDS
- USACE Memorandum for Record-CQAR of Quality Assurance Split Samples. (Split Samples not collected in accordance to CENAB direction.)

Located on CD.

APPENDIX H – GEOGRAPHIC INFORMATION SYSTEMS DATA

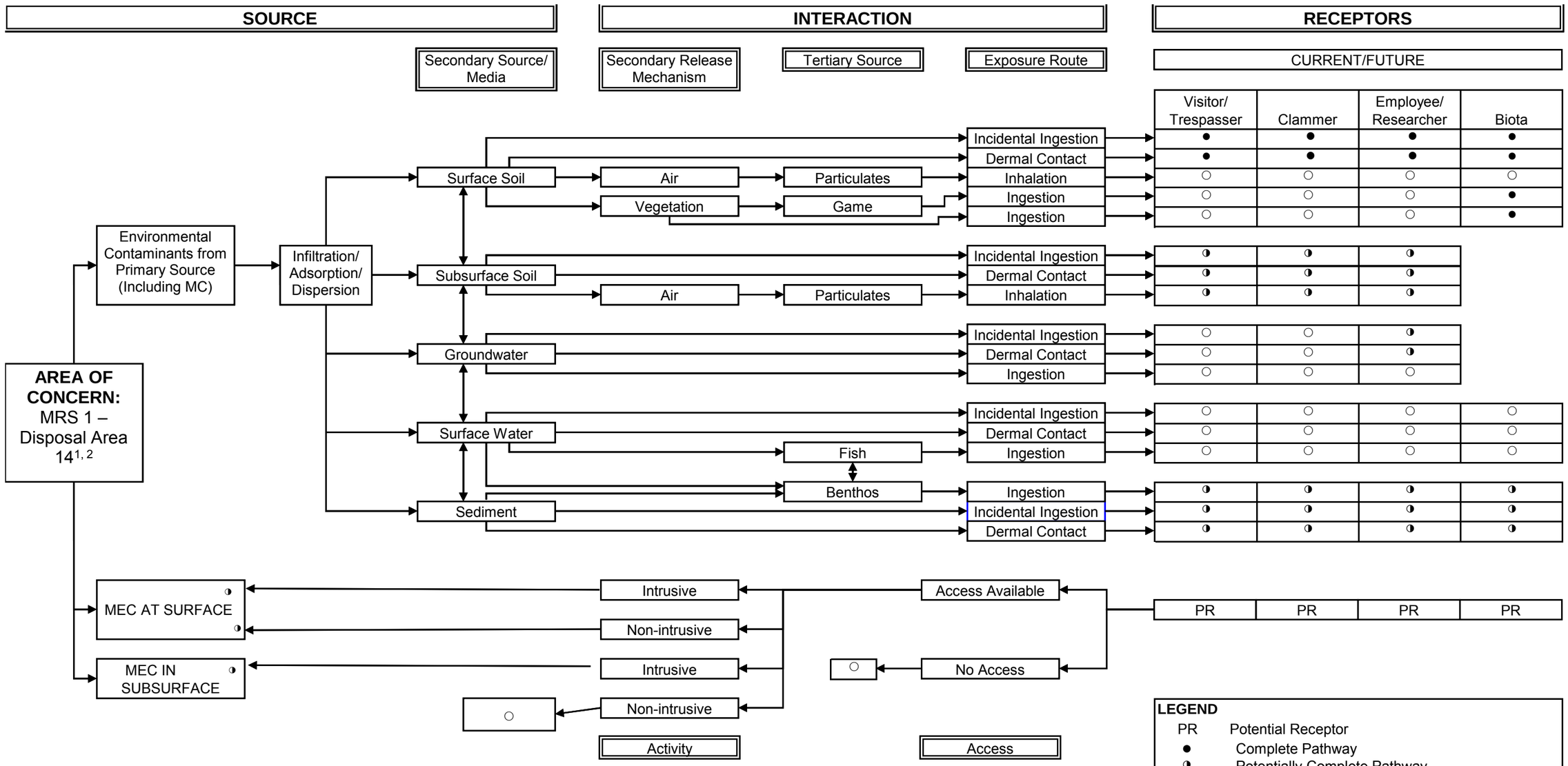
Located on CD.

APPENDIX I – GEOPHYSICAL DATA

Appendix not used.

APPENDIX J – CONCEPTUAL SITE MODEL

- MRS 1
- PAOI 1-4



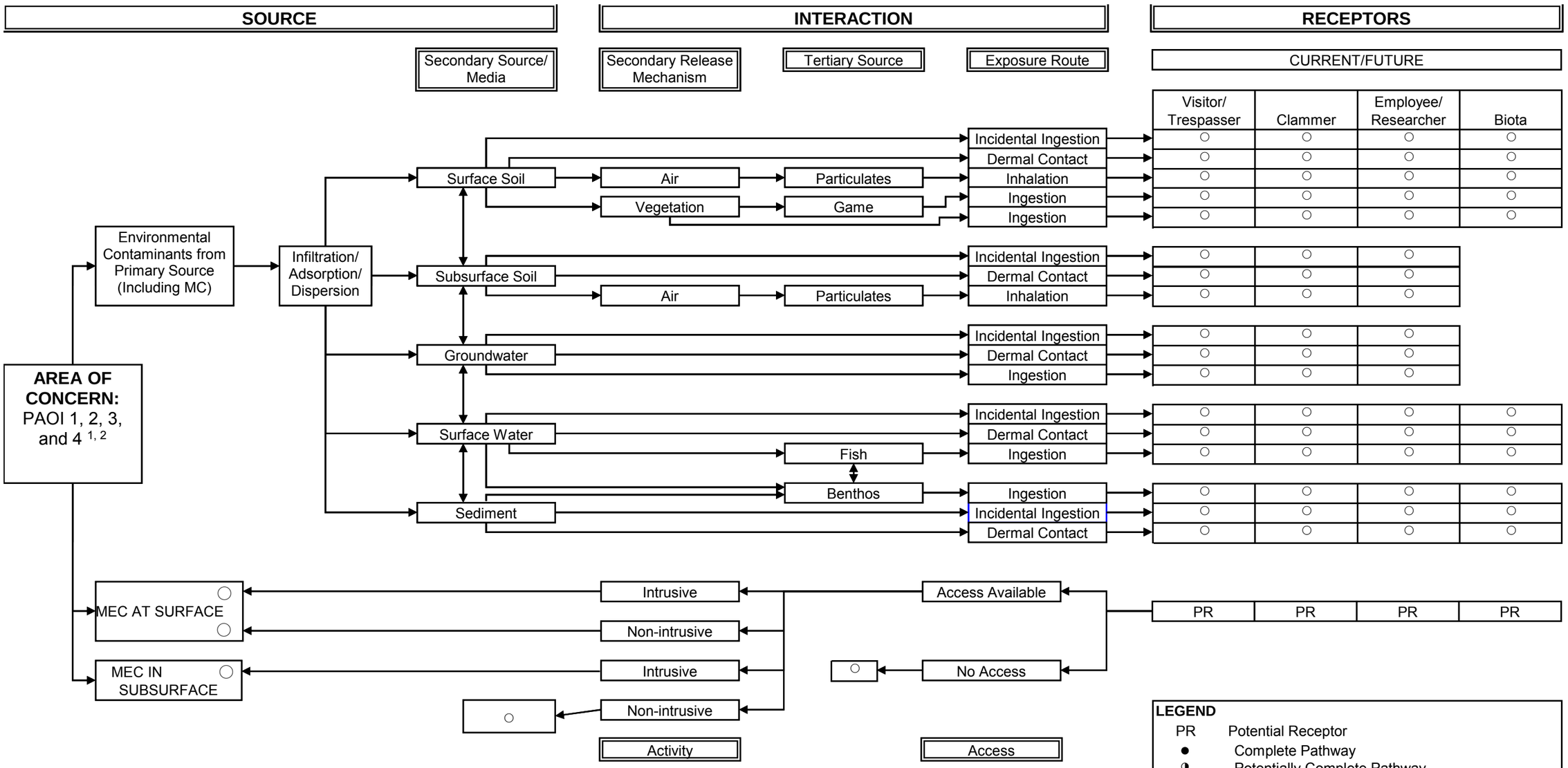
NOTES:

1. For the MMRP SI at Gould Island, this CSM summarizes the potential risk exposure scenarios for MRS 1 within the Gould Island FUDS. For a pathway to be complete, it must include a source, an exposure medium, an exposure route, and a receptor. A complete pathway may also include a release mechanism and a transport medium. Interaction between a potential receptor and MEC has two components: access and activity.

2. Primary sources will vary but will include areas where historical MEC or MD disposal activities occurred. MRS 1 is located on the western side of the island. Historical documentation indicates that there have been no findings of MEC in the area. MD was identified during the ASR site visit. The beach area of the MRS is littered with significant amounts of concrete and metal debris. No MEC/MD were noted or observed during SI reconnaissance. Surface soil was evaluated as a potentially complete pathway and, based on sampling results was determined to be complete. Subsurface soil and Sediment pathways were also evaluated as potentially complete in the work plan. MQOs for sensitivity were not met for nitroglycerine in subsurface soil and sediment with respect to the associated human health screening level, consequently contamination may be present in these media at concentrations above the aforementioned human health screening level and the subsurface soil and sediment pathways remain potentially complete. Furthermore, MQOs for sensitivity were not met for six explosives in sediments with regard to ecological screening levels; therefore, contamination may be present in sediment at concentrations above the aforementioned ecological screening levels and the pathway remains potentially complete. Groundwater remains a potentially complete pathway as no groundwater sample was collected due to refusal in the subsurface. Surface water was not identified as a potential media of concern as there are no surface water features within the MRS. The air migration pathway for MRS 1 has an extremely low potential, if any, for human and/or ecological receptors to come into contact with the analytes detected in surface soil because of the vegetative cover; therefore, this medium is an incomplete pathway.

DIAGRAM OF THE INTEGRATED CONCEPTUAL SITE MODEL FOR
Gould Island Naval Torpedo Testing Facility MMRP FUDS SITE[1,2]
MRS 1 - Disposal Area 14
Revised (August 2009) J-1

Source: U.S. Army Corps of Engineers (USACE). 2003. *Conceptual Site Models for Ordnance and Explosives (OE) and Hazardous, Toxic, and Radioactive Wastes (HTRW) Projects.* EM 1110-1-1200.



NOTES:

1. For the MMRP SI at Gould Island, this CSM summarizes the potential risk exposure scenarios for PAOIs 1-4 within the Gould Island FUDS. For a pathway to be complete, it must include a source, an exposure medium, an exposure route, and a receptor. A complete pathway may also include a release mechanism and a transport medium. Interaction between a potential receptor and MEC has two components: access and activity.

2. Primary sources will vary but will include areas where historical munitions storage activities occurred. PAOIs 1-4 are located in various areas on Gould Island. Historical documentation indicates that there have been no findings of MEC/MD in these PAOIs. Access was limited to some of these areas during the SI but no MEC/MD was noted or observed during SI reconnaissance around these areas; therefore, in accordance with stakeholder agreements and the Final SS-WP, no surface soil samples were collected. Surface soil was evaluated as a potentially complete pathway during the work plan and, based on the evidence of no MEC/MD on the surface, the surface soil pathway was determined to be incomplete. Subsurface soil, groundwater, and Sediment pathways were not identified as media of concern within the PAOIs. Surface water was not a potential media of concern as there are no surface water features within the MRS. The air migration pathway for MRS 1 has an extremely low potential, if any, for human and/or ecological receptors to come into contact with surface soil because of the vegetative cover; therefore, this medium is an incomplete pathway.

DIAGRAM OF THE INTEGRATED CONCEPTUAL SITE MODEL FOR
Gould Island Naval Torpedo Testing Facility MMRP FUDS SITE[1,2]
PAOIs - 1, 2, 3, and 4
Revised (August 2009) J-2

Source: U.S. Army Corps of Engineers (USACE). 2003. *Conceptual Site Models for Ordnance and Explosives (OE) and Hazardous, Toxic, and Radioactive Wastes (HTRW) Projects.* EM 1110-1-1200.

APPENDIX K – MUNITIONS RESPONSE SITE PRIORITIZATION PROTOCOL RESULTS

- MRS 1

Table A
MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from DoD databases, such as RMIS. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the MRS summary, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental non-munitions related contaminants found at the MRS (e.g., benzene, trichloroethylene), and any potentially exposed human and ecological receptors. Include a map of the MRS, if one is available.

Munitions Response Site Name: MRS 1 - Disposal Area 14

Component: U.S. Army

Installation/Property Name: Gould Island [FFID # RI19799F213100]

Location (City, County, State): Jamestown, Newport County, Rhode Island

Site Name (RMIS ID)/Project Name (Project No.): Gould Island (D01RI033803R01)/(D01RI033803)

Date Information Entered/Updated: 8/18/2009 11:10:43 AM

Point of Contact (Name/Phone): Ellen Iorio / (978) 318-8433

Project Phase (check only one):

o PA	n SI	o RI	o FS	o RD
o RA-C	o RIP	o RA-O	o RC	o LTM

Media Evaluated (check all that apply):

o Groundwater	n Sediment (human receptor)
n Surface soil	o Surface Water (ecological receptor)
n Sediment (ecological receptor)	o Surface Water (human receptor)

MRS Summary:

MRS Description: Describe the munitions-related activities that occurred at the installation, the dates of operation, and the UXO, DMM (by type of munition, if known) or munitions constituents (by type, if known) known or suspected to be present):

The Gould Island FUDS was responsible for testing up to 100 inert torpedoes daily during the period ranging from 1 January 1939 to 1 June 1946. Gould Island contained a pyrotechnic storage building, a magazine igniter storage building, two torpedo warhead storage bunkers (one of which was converted ot a pistol range), four gun mounts, a torpedo overhaul shop, and a torpedo testing facility with firing pier. Historically, one inert item classified as MD (aft section of a torpedo) was identified during the 1995 ASR site visit. No MEC/MD were observed during the 2008 SI reconnaissance activities. Refer to Sections 2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.4.2.1, 2.4.3.1, 2.4.4.1, 2.4.5.1, 4.2.1.1, 4.3.1.1 and Table 2-2 of the SI report for more information.

Description of Pathways for Human and Ecological Receptors:

Incidental Ingestion, Dermal Contact, Inhalation and Ingestion

Description of Receptors (Human and Ecological):

Visitors/Trespassers, Clammers, Employees/Researchers, and Biota

Table 1

EHE Module: Munitions Type Data Element Table

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the score(s) that correspond with **all** munitions types known or suspected to be present at the MRS.

Note: The terms practice munitions, small arms, physical evidence, and historical evidence are defined in Appendix C of the Primer.

Classification	Description	Score
Sensitive	u All UXO that are considered likely to function upon any interaction with exposed persons [e.g., submunitions, 40mm high-explosive (HE) grenades, white phosphorus (WP) munitions, high-explosive antitank (HEAT) munitions, and practice munitions with sensitive fuzes, but excluding all other practice munitions]. u All hand grenades containing energetic filler. u Bulk primary explosives, or mixtures of these with environmental media, such that the mixture poses an explosive hazardard.	30
High explosive (used or damaged)	u All UXO containing a high-explosive filler (e.g., RDX, Composition B), that are not considered "sensitive." u All DMM containing a high-explosive filler that have: n Been damaged by burning or detonation n Deteriorated to the point of instability.	*25*
Pyrotechnic (used or damaged)	u All UXO containing pyrotechnic fillers other than white phosphorous (e.g., flares, signals, simulators, smoke grenades). u All DMM containing pyrotechnic fillers other than white phosphorous (e.g., flares, signals, simulators, smoke grenades) that have: n Been damaged by burning or detonation n Deteriorated to the point of instability.	20
High explosive (unused)	u All DMM containing a high explosive filler that: n Have not been damaged by burning or detonation n Are not deteriorated to the point of instability.	15
Propellant	u All UXO containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). u All DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor) that are: n Damaged by burning or detonation n Deteriorated to the point of instability.	15
Bulk secondary high explosives, pyrothechnics, or propellant	u All DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor), that are deteriorated. u Bulk secondary high explosives, pyrotechnic compositions, or propellant (not contained in a munition), or mixtures of these with environmental media such that the mixture poses an explosive hazard.	10
Pyrotechnic (not used or damaged)	u All DMM containing a pyrotechnic fillers (i.e., red phosphorous), other than white phosphorous filler, that: n Have not been damaged by burning or detonation n Are not deteriorated to the point of instability.	10
Practice	u All UXO that are practice munitions that are not associated with a sensitive fuze. u All DMM that are practice munitions that are not associated with a sensitive fuze and that have not: n Been damaged by burning or detonation n Deteriorated to the point of instability.	*5*
Riot control	u All UXO or DMM containing a riot control agent filler (e.g., tear gas).	3
Small arms	u All used munitions or DMM that are categorized as small arms ammunition [Physical evidence or historical evidence that no other types of munitions (e.g., grenades, subcaliber training rockets, demolition charges) were used or are present on the MRS is required for selection of this category.].	*2*
Evidence of no munitions	u Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	0
MUNITIONS TYPE	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30).	*25*

DIRECTIONS: Document any MRS-specific data used in selecting the ***Munitions Type*** classifications in the space provided.

MRS 1, which is located along the western side of Gould Island, was used as a disposal area for various items. Historically, one inert item (the aft end of a torpedo) classified as MD was found in the disposal area along the beach during the 1995 ASR site visit. Munitions reportedly stored at the site included flares and screening smoke, torpedoes/sea mines, medium caliber (1.1 inch) ammunition and .45 caliber small arms ammunition. The facility included pyrotechnic storage, magazine igniter warhead storage and torpedo overhaul shops, which may be a source of MEC/MD. No MEC/MD was found during the 2008 SI activities. Based on previous investigations and this SI, there is no evidence to prove or disprove that UXO or DMM is not present. Refer to Sections 2.4.3.1, 2.5.1, 4.2.1.1, 4.3.1.1 and Table 2-2 of this SI report for more information.

Table 2

EHE Module: Source of Hazard Data Element Table

DIRECTIONS: Below are 11 classifications describing sources of explosive hazards. Circle the score(s) that correspond with **all** sources of explosive hazards known or suspected to be present at the MRS.

Note: The terms former range, practice munitions, small arms, physical evidence, and historical evidence are defined in Appendix C of the Primer.

Classification	Description	Score
Former range	u The MRS is a former military range where munitions (including practice munitions with sensitive fuzes) have been used. Such areas include: impact or target areas, associated buffer and safety zones, firing points, and live-fire maneuver areas.	10
Former munitions treatment (i.e., OB/OD) unit	u The MRS is a location where UXO or DMM (e.g., munitions, bulk explosives, bulk pyrotechnic, or bulk propellants) were burned or detonated for the purpose of treatment prior to disposal.	8
Former practice munitions range	u The MRS is a former military range on which only practice munitions without sensitive fuzes were used.	6
Former maneuver area	u The MRS is a former maneuver area where no munitions other than flares, simulators, smokes, and blanks were used. There must be evidence that no other munitions were used at the location to place an MRS into this category.	5
Former burial pit or other disposal area	u The MRS is a location where DMM were buried or disposed of (e.g., disposed of into a water body) without prior thermal treatment.	*5*
Former industrial operating facilities	u The MRS is a location that is a former munitions maintenance, manufacturing, or demilitarization facility.	4
Former firing points	u The MRS is a firing point, where the firing point is delineated as an MRS separate from the rest of a former military range.	4
Former missile or air defense artillery emplacements	u The MRS is a former missile defense or air defense artillery (ADA) emplacement not associated with a military range.	2
Former storage or transfer points	u The MRS is a location where munitions were stored or handled for transfer between different modes of transportation (e.g., rail to truck, truck to weapon system).	2
Former small arms range	u The MRS is a former military range where only small arms ammunition was used [There must be evidence that no other types of munitions (e.g., grenades) were used or are present to place an MRS into this category.].	1
Evidence of no munitions	u Following investigation of the MRS, there is physical evidence that no UXO or DMM are present, or there is historical evidence indicating that no UXO or DMM are present.	0
SOURCE OF HAZARD	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).	*5*

DIRECTIONS: Document any MRS-specific data used in selecting the ***Source of Hazard*** classifications in the space provided.

Disposal Area 14 (MRS 1) is located on the western portion of Gould Island and was used as a dumping area for various items. the ASR noted that MD was identified during the ASR site visit in 1995. The facility included pyrotechnic storage, magazine igniter warhead storage and torpedo overhaul shops, which may be a source of MEC/MD. There was no evidence of MEC, MD, or MPPEH identified during the 2008 SI reconnaissance activities. Refer to Sections 2.4.5.1, 2.5.0.1, 4.1.2, 4.2.1.1, 4.3.1.1 and Table 2-2 of the SI report for more information.

Table 3

EHE Module: Location of Munitions Data Element Table

DIRECTIONS: Below are eight classifications of munitions locations and their descriptions. Circle the score(s) that correspond with **all** locations where munitions are located or suspected of being found at the MRS.

Note: The terms surface, subsurface, physical evidence, and historical evidence are defined in Appendix C of the Primer.

Classification	Description	Score
Confirmed surface	u Physical evidence indicates that there are UXO or DMM on the surface of the MRS u Historical evidence (e.g., a confirmed incident report or accident report) indicates there are UXO or DMM on the surface of the MRS.	25
Confirmed subsurface, active	u Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS,and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost, heat heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM. u Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost, heat heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM.	20
Confirmed subsurface, stable	u Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed. u Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed.	15
Suspected (physical evidence)	u There is physical evidence (e.g., munitions debris, such fragments, penetrators, projectiles, shell casings, links, fins), other than the documented presence of UXO or DMM, indicating that UXO or DMM may be present at the MRS.	10
Suspected (historical evidence)	u There is historical evidence indicating that UXO or DMM may be present at the MRS.	*5*
Subsurface, physical constraint	u There is physical or historical evidence indicating that UXO or DMM may be present in the subsurface, but there is a physical constraint (e.g., pavement, water depth over 120 feet) preventing direct access to the UXO or DMM.	2
Small arms (regardless of location)	u The presence of small arms ammunition is confirmed or suspected, regardless of other factors such as geological stability [There must be evidence that no other types of munitions (e.g., grenades) were used or are present at the MRS to place an MRS into this category.].	1
Evidence of no munitions	u Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	0
LOCATION OF MUNITIONS	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 25).	*5*

DIRECTIONS: Document any MRS-specific data used in selecting the ***Location of Munitions*** classifications in the space provided.

Historical documents (ASR and ASR supplement) indicate that MD was encountered historically. During the 2008 SI field sampling activities, no MEC or MD were observed during the qualitative reconnaissance activities. Refer to Sections 2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.2.1, 2.2.2), 2.4.3.1, 2.4.5.1 and 2.5.0.1 of the SI report for more information.

Table 4

EHE Module: Ease of Access Data Element Table

DIRECTIONS: Below are four classifications of barrier types that can surround an MRS and their descriptions. The barrier type is directly related to the ease of public access to any explosive materiel. Circle the score that corresponds with the ease of access to the MRS.

Note: The term barrier is defined in Appendix C of the Primer.

Classification	Description	Score
No barrier	u There is no barrier preventing access to any part of the MRS (i.e., all parts of the MRS are accessible).	10
Barrier to MRS access is incomplete	u There is a barrier preventing access to parts of the MRS, but not the entire MRS.	*8*
Barrier to MRS access is complete but not monitored	u There is a barrier preventing access to all parts of the MRS, but there is no surveillance (e.g., by a guard) to ensure that the barrier is effectively preventing access to all parts of the MRS.	5
Barrier to MRS access is complete and monitored	u There is a barrier preventing access to all parts of the MRS, and there is active, continual surveillance (e.g., by a guard, video monitoring) to ensure that the barrier is effectively preventing access to all parts of the MRS.	0
EASE OF ACCESS	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 10).	*8*

DIRECTIONS: Document any MRS-specific data used in selecting the ***Ease of Access*** classifications in the space provided.

MRS 1 is located on Gould Island in Narragansett Bay. The FUDS eligible portion of the island is used as a nature preserve and is accessible by boat as depths in the bay can exceed 25 feet.The Navy confirmed that there are periodic patrols of Gould Island by the Navy; however, this surveillance does not occur on a regular basis. Additionally, RIDEM has to coordinate with the Navy if visits to the northern portion of the island, which is owned by the Navy (FUDS ineligible portion), are planned. RIDEM does not have to coordinate with the Navy if visiting the southern (FUDS eligible) portion of the island. Lastly, the Navy stated that trespassers and fishermen have access to the entire island and public visits the island without the Navy's knowledge. Communications regarding surveillance can be found in Appendix C of this SI report. Refer to Sections 1.3.1, 2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.3.1.1, 2.3.1.2, 2.3.3.1, 2.3.3.2, 2.3.3.3, 2.3.4.1, 2.3.4.2 and 4.2.1.1 of the SI report for more information.

Table 5

EHE Module: Status of Property Data Element Table

DIRECTIONS: Below are three classifications of the status of a property within the Department of Defense (DoD) and their descriptions. Circle the score that corresponds with the status of property at the MRS.

Classification	Description	Score
Non-DoD control	▫ The MRS is at a location that is no longer owned by, leased to, or otherwise possessed or used by DoD. Examples are privately owned land or water bodies; land or water bodies owned or controlled by state, tribal, or local governments; and land or water bodies managed by other federal agencies.	*5*
Scheduled for transfer from DoD control	▫ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD, and DoD plans to transfer that land or water body to the control of another entity (e.g., a state, tribal, or local government; a private party; another federal agency) within 3 years from the date the rule is applied.	3
DoD control	▫ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD. With respect to property that is leased or otherwise possessed, DoD must control access to the MRS 24 hours per day, every day of the calendar year.	0
STATUS OF PROPERTY	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	*5*

DIRECTIONS: Document any MRS-specific data used in selecting the ***Status of Property*** classifications in the space provided.

MRS 1 is located on private property owned by the state of Rhode Island and is managed as a wildlife area. Refer to Sections 2.3.4.1 and 2.3.4.2 of the SI report for more information.

Table 6

EHE Module: Population Density Data Element Table

DIRECTIONS: Below are three classifications of population density and their descriptions. Determine the population density per square mile in the vicinity of the MRS and circle the score that corresponds with the associated population density.

Note: If an MRS is located in more than one county, use the largest population density value among the counties. If the MRS is within or borders a city or town, use the population density for the city or town, rather than that of the county.

Classification	Description	Score
> 500 persons per square mile	u There are more than 500 persons per square mile in the county in which the MRS is located, based on U.S. Census Bureau data.	*5*
100–500 persons per square mile	u There are 100 to 500 persons per square mile in the county in which the MRS is located, based on U.S. Census Bureau data.	3
< 100 persons per square mile	u There are fewer than 100 persons per square mile in the county in which the MRS is located, based on U.S. Census Bureau data.	1
POPULATION DENSITY	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	*5*

DIRECTIONS: Document any MRS-specific data used in selecting the ***Population Density*** classifications in the space provided.

The population of Jamestown, Rhode Island which contains the FUDS was 580 persons per square miile (mi2) (US CENSUS 2009). Refer to Section 2.3.3.3 of the SI report for more information.

Table 7

EHE Module: Population Near Hazard Data Element Table

DIRECTIONS: Below are six classifications describing the number of inhabited structures near the MRS. The number of inhabited buildings relates to the population near the hazard. Determine the number of inhabited structures within two miles of the MRS boundary and circle the score that corresponds with the associated population near the known or suspected hazard.

Note: The term inhabited structures is defined in Appendix C of the Primer.

Classification	Description	Score
26 or more inhabited structures	There are 26 or more inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	5
16 to 25 inhabited structures	There are 16 to 25 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	4
11 to 15 inhabited structures	There are 11 to 15 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	3
6 to 10 inhabited structures	There are 6 to 10 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	2
1 to 5 inhabited structures	There are 1 to 5 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	*1*
0 inhabited structures	There are no inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	0
POPULATION NEAR HAZARD	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	*1*

DIRECTIONS: Document any MRS-specific data used in selecting the ***Population Near Hazard*** classifications in the space provided.

Based on review of aerial photos, it was determined that less than 5 inhabited structures (associated with the portion of Gould Island owned/controlled by the Navy) are located within 2 miles of the MRS boundary. Refer to Sections 2.3.3.2, 2.3.3.3 and Figures 2-2, 2-4, and 2-5 of the SI report.

Table 8

EHE Module: Types of Activities/Structures Data Element Table

DIRECTIONS: Below are five classifications of activities and/or inhabited structures near the hazard and their descriptions. Review the types of activities that occur and/or structures that are present within two miles of the MRS and circle the score(s) that correspond with **all** the activities/structures classifications at the MRS.

Note: The term inhabited structure is defined in Appendix C of the Primer.

Classification	Description	Score
Residential, educational, commercial, or subsistence	u Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with any of the following purposes: residential, educational, child care, critical assets (e.g., hospitals, fire and rescue, police stations, dams), hotels, commercial, shopping centers, playgrounds, community gathering areas, religious sites, or sites used for subsistence hunting, fishing, and gathering.	5
Parks and recreational areas	u Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with parks, nature preserves, or other recreational uses.	*4*
Agricultural, forestry	u Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with agriculture or forestry.	3
Industrial or warehousing	u Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with industrial activities or warehousing.	*2*
No known or recurring activities	u There are no known or recurring activities occurring up to two miles from the MRS's boundary or within the MRS's boundary.	1
TYPES OF ACTIVITIES/STRUCTURES	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	***4***

DIRECTIONS: Document any MRS-specific data used in selecting the ***Types of Activities/Structures*** classifications in the space provided.

MRS 1 is located on private property owned by the State of Rhode Island and managed as a wildlife area. The Navy still owns and uses a portion of the island for storage and testing. Refer to Sections 2.3.4.1, 2.3.4.2, and 2.4.3.1 of the SI report for more information.

Table 9

EHE Module: Ecological and/or Cultural Resources Data Element Table

DIRECTIONS: Below are four classifications of ecological and/or cultural resources and their descriptions. Review the types of resources present and circle the score that corresponds with the ecological and/or cultural resource classifications at the MRS.

Note: The terms ecological resources and cultural resources are defined in Appendix C of the Primer.

Classification	Description	Score
Ecological and cultural resources present	u There are both ecological and cultural resources present on the MRS.	5
Ecological resources present	u There are ecological resources present on the MRS.	*3*
Cultural resources present	u There are cultural resources present on the MRS.	3
No ecological or cultural resources present	u There are no ecological resources or cultural resources present on the MRS.	0
ECOLOGICAL AND/OR CULTURAL RESOURCES	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 5).	*3*

DIRECTIONS: Document any MRS-specific data used in selecting the ***Ecological and/or Cultural Resources*** classifications in the space provided.

The site is operated as a state wildlife refuge. RIDEM Division of Fish and Wildlife reported that there are no federally listed species present on Gould Island. However, RIDEM did state that a small heronry in the southwest corner of the island and a large gull colony on the exposed flat of the former torpedo facility existed and may be used for breeding, but that the timing of the sampling event would not affect any biological species (RIDEM 2008). Based on a review of the RIDEM website it was noted that Gould Island is designated a “Natural Heritage Area for Rare Species” (RIDEM 2009). The USFWS and NOAA stated that there are no fedrally designated or proposed T&E ecological recources or cultural resources present on the FUDS. Refer to Sections 2.3.8.1.2, 3.2.1.1 and 3.2.2.1 of the SI report for more information.

Table 10
Determining the EHE Module Rating

DIRECTIONS:

1. From Tables 1–9, record the data element scores in the **Score** boxes to the right.
2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.
3. Add the three **Value** boxes and record this number in the **EHE Module Total** box below.
4. Circle the appropriate range for the **EHE Module Total** below.
5. Circle the **EHE Module Rating** that corresponds to the range selected and record this value in the **EHE Module Rating** box found at the bottom of the table.

Note:
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

	Source	Score	Value
Explosive Hazard Factor Data Elements			
Munitions Type	Table 1	25	30
Source of Hazard	Table 2	5	
Accessibility Factor Data Elements			
Location of Munitions	Table 3	5	18
Ease of Access	Table 4	8	
Status of Property	Table 5	5	
Receptor Factor Data Elements			
Population Density	Table 6	5	13
Population Near Hazard	Table 7	1	
Types of Activities/ Structures	Table 8	4	
Ecological and /or Cultural Resources	Table 9	3	
EHE MODULE TOTAL			*61*

EHE Module Total	EHE Module Rating
92 to 100	A
82 to 91	B
71 to 81	C
60 to 70	*D*
48 to 59	E
38 to 47	F
less than 38	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected Explosive Hazard
EHE MODULE RATING	*D*

Table 11

CHE Module: CWM Configuration Data Element Table

DIRECTIONS: Below are seven classifications of CWM configuration and their descriptions. Circle the score(s) that correspond to **all** CWM configurations known or suspected to be present at the MRS.

Note: The terms CWM/UXO, CWM/DMM, physical evidence, and historical evidence are defined in Appendix C of the Primer.

Classification	Description	Score
CWM, explosive configuration either UXO or damaged DMM	The CWM known or suspected of being present at the MRS is: u Explosively configured CWM that are UXO (i.e., CWM/UXO). u Explosively configured CWM that are DMM (i.e., CWM/DMM) that have been damaged.	30
CWM mixed with UXO	u The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged, or nonexplosively configured CWM/DMM, or CWM not configured as a munition, that are commingled with conventional munitions that are UXO.	25
CWM, explosive configuration that are undamaged DMM	u The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged.	20
CWM, not explosively configured or CWM, bulk container	The CWM known or suspected of being present at the MRS is: u Nonexplosively configured CWM/DMM. u Bulk CWM/DMM (e.g., ton container).	15
CAIS K941 and CAIS K942	u The CWM/DMM known or suspected of being present at the MRS is CAIS K941-toxic gas set M-1 or CAIS K942-toxic gas set M-2/E11.	12
CAIS (chemical agent identification sets)	u Only CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS.	10
Evidence of no CWM	u Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS.	*0*
CWM CONFIGURATION	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30).	*0*

DIRECTIONS: Document any MRS-specific data used in selecting the ***CWM Configuration*** classifications in the space provided.

Based on review of the ASR, CWM was not used, stored or disposed of at Gould Island (USACE 1995). Refer to Section 2.4.0.1 of the SI report.

Table 20
Determining the CHE Module Rating

DIRECTIONS:

1. From Tables 11–19, record the data element scores in the **Score** boxes to the right.
2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.
3. Add the three **Value** boxes and record this number in the **CHE Module Total** box below.
4. Circle the appropriate range for the **CHE Module Total** below.
5. Circle the **CHE Module Rating** that corresponds to the range selected and record this value in the **CHE Module Rating** box found at the bottom of the table.

Note:
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

	Source	Score	Value
CWM Hazard Factor Data Elements			
CWM Configuration	Table 11	0	0
Sources of CWM	Table 12		
Accessibility Factor Data Elements			
Location of CWM	Table 13		0
Ease of Access	Table 14		
Status of Property	Table 15		
Receptor Factor Data Elements			
Population Density	Table 16		0
Population Near Hazard	Table 17		
Types of Activities/ Structures	Table 18		
Ecological and /or Cultural Resources	Table 19		
CHE MODULE TOTAL			*0*

CHE Module Total	CHE Module Rating
92 to 100	A
82 to 91	B
71 to 81	C
60 to 70	D
48 to 59	E
38 to 47	F
less than 38	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected CWM Hazard
CHE MODULE RATING	***No Known or Suspected CWM Hazard***

Table 21

HHE Module: Groundwater Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the maximum concentrations of all contaminants in the MRS's groundwater and their comparison values (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the ratios for each contaminant by dividing the maximum concentration by the comparison value. Determine the CHF by adding the ratios for each medium together, including additional contaminants recorded on Table 27. Based on the CHF, use the CHF Scale to determine and record the CHF Value. If there is no known or suspected MC hazard present in the groundwater, select the box at the bottom of the table.

Note: Use dissolved, rather than total, metals analyses when both are available.

Contaminant	Maximum Concentration	Comparison Value	Unit	Ratios

CHF Scale	CHF Value	Sum The Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the groundwater migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the groundwater is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in groundwater has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the groundwater to a potential point of exposure (possibly due to geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the groundwater receptors at the MRS.

Classification	Description	Value
Identified	There is a threatened water supply well downgradient of the source and the groundwater is a current source of drinking water or source of water for other beneficial uses such as irrigation/agriculture (equivalent to Class I or IIA aquifer).	H
Potential	There is no threatened water supply well downgradient of the source and the groundwater is currently or potentially usable for drinking water, irrigation, or agriculture (equivalent to Class I, IIA, or IIB aquifer).	M
Limited	There is no potentially threatened water supply well downgradient of the source and the groundwater is not considered a potential source of drinking water and is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only).	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Groundwater MC Hazard	o

Table 21 Comments: Refusal was encountered and no groundwater samples were collected for MRS 1. Refer to Section 5.2.4.1 of the SI report for more information.

Table 22

HHE Module: Surface Water – Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the maximum concentrations of all contaminants in the MRS's groundwater and their comparison values (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the ratios for each contaminant by dividing the maximum concentration by the comparison value. Determine the CHF by adding the ratios for each medium together, including additional contaminants recorded on Table 27. Based on the CHF, use the CHF Scale to determine and record the CHF Value. If there is no known or suspected MC hazard for human endpoints present in the surface water, select the box at the bottom of the table.

Note: Use dissolved, rather than total, metals analyses when both are available.

Contaminant	Maximum Concentration	Comparison Value	Unit	Ratios

CHF Scale	CHF Value	Sum The Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		

CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Water (Human Endpoint) MC Hazard	n

Table 22 Comments: Surface water is not a medium of concern and was not sampled during the 2008 SI activities in acordance with stakeholder agreements and the Final SS-WP (Alion 2008b). Refer to Sections 2.3.6.1 and 5.4.3.1 of the SI report for more information.

Table 23

HHE Module: Sediment – Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the maximum concentrations of all contaminants in the MRS's groundwater and their comparison values (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the ratios for each contaminant by dividing the maximum concentration by the comparison value. Determine the CHF by adding the ratios for each medium together, including additional contaminants recorded on Table 27. Based on the CHF, use the CHF Scale to determine and record the CHF Value. If there is no known or suspected MC hazard for human endpoints present in the sediment, select the box at the bottom of the table.

Contaminant	Maximum Concentration	Comparison Value	Unit	Ratios

CHF Scale	CHF Value	Sum The Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Sediment (Human Endpoint) MC Hazard	n

Table 23 Comments: Two sediment samples and a duplicate sediment sample were collected in MRS 1. Sample ID GI-DA-SD02-01 and GI-DA-SD02-02 and GI-SD-DUP 1. No explosives were detected within the samples. Reference Section 5.4.3 and Table 5-2 in the SI report.

Table 24

HHE Module: Surface Water – Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the maximum concentrations of all contaminants in the MRS's surface water and their comparison values (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the ratios for each contaminant by dividing the maximum concentration by the comparison value. Determine the CHF by adding the ratios for each medium together, including additional contaminants recorded on Table 27. Based on the CHF, use the CHF Scale to determine and record the CHF Value. If there is no known or suspected MC hazard for ecological endpoints present in the surface water, select the box at the bottom of the table.

Contaminant	Maximum Concentration	Comparison Value	Unit	Ratios

CHF Scale	CHF Value	Sum The Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Water (Ecological Endpoint) MC Hazard n

Table 24 Comments: Surface water is not a medium of concern and was not sampled during the 2008 SI activities in acordance with stakeholder agreements and the Final SS-WP (Alion 2008b). Refer to Sections 2.3.6.1 and 5.4.3.1 of the SI report for more information.

Table 25

HHE Module: Sediment – Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the maximum concentrations of all contaminants in the MRS's sediment and their comparison values (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the ratios for each contaminant by dividing the maximum concentration by the comparison value. Determine the CHF by adding the ratios for each medium together, including additional contaminants recorded on Table 27. Based on the CHF, use the CHF Scale to determine and record the CHF Value. If there is no known or suspected MC hazard for ecological endpoints present in the sediment, select the box at the bottom of the table.

Contaminant	Maximum Concentration	Comparison Value	Unit	Ratios

CHF Scale	CHF Value	Sum The Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	

No Known or Suspected Sediment (Ecological Endpoint) MC Hazard	n

Table 25 Comments: Two sediment samples and a duplicate sediment sample were collected in MRS 1. Sample ID GI-DA-SD02-01 and GI-DA-SD02-02 and GI-SD-DUP 1. No explosives were detected within the samples. Reference Section 5.4.3 and Table 5-2 in the SI report.

Table 26
HHE Module: Surface Soil Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the maximum concentrations of all contaminants in the MRS's surface soil and their comparison values (from Appendix B) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the ratios for each contaminant by dividing the maximum concentration by the comparison value. Determine the CHF by adding the ratios for each medium together, including additional contaminants recorded on Table 27. Based on the CHF, use the CHF Scale to determine and record the CHF Value. If there is no known or suspected MC hazard present in the surface soil, select the box at the bottom of the table.

Contaminant	Maximum Concentration	Comparison Value	Unit	Ratios
Nitroglycerine	1200	1000	mg/Kg	1.2

CHF Scale	CHF Value	Sum The Ratios	1.2
CHF > 100	H (High)	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		

CONTAMINANT HAZARD FACTOR	**DIRECTIONS:** Record **the CHF Value** from above in the box to the right (maximum value = H).	*L*

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface soil migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface soil is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface soil has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface soil to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	*L*

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface soil receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface soil to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface soil to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface soil to which contamination has moved or can move.	L
RECEPTOR FACTOR	**DIRECTIONS:** Record **the single highest value** from above in the box to the right (maximum value = H).	*L*
	No Known or Suspected Surface Soil MC Hazard	o

Table 26 Comments: Within MRS 1, nitroglycerin was detected in surface soil at a concentration above its respective reporting limit. Nitroglycerin detected in the sample GI-DA-SS-02-01 at levels (1,200 mg/kg) which exceeded the regional screening level (0.61 mg/kg) for residential soil. Refer to Section 5.4.1.3 and Table 5-1 of the SI report for additional information.

Table 27

HHE Module: Supplemental Contaminant Hazard Factor Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Only use this table if there are more than five contaminants present at the MRS. This is a supplemental table designed to hold information about contaminants that do not fit in the previous tables. Indicate the media in which these contaminants are present. Then record all contaminants, their maximum concentrations and their comparison values (from Appendix B) in the table below. Calculate and record the ratio for each contaminant by dividing the maximum concentration by the comparison value. Determine the CHF for each medium on the appropriate media-specific tables.

Note: Remember not to add ratios from different media.

Media	Contaminant	Maximum Concentration	Comparison Value	Ratio

Table 28
Determining the HHE Module Rating

DIRECTIONS:

1. Record the letter values (H, M, L) for the Contaminant Hazard, Migration Pathway, and Receptor Factors for the media (from Tables 21–26) in the corresponding boxes below.
2. Record the media's three-letter combinations in the Three-Letter Combination boxes below (three-letter combinations are arranged from Hs to Ms to Ls).
3. Using the reference provided below, determine each media's rating (A–G) and record the letter in the corresponding Media Rating box below.

Media (Source)	Contaminant Hazard Factor Value	Migratory Pathway Factor Value	Receptor Factor Value	Three-Letter Combination (Hs-Ms-Ls)	Media Rating (A-G)
Groundwater (Table 21)					
Surface Water/Human Endpoint (Table 22)					
Sediment/Human Endpoint (Table 23)					
Surface Water/Ecological Endpoint (Table 24)					
Sediment/Ecological Endpoint (Table 25)					
Surface Soil (Table 26)	L	L	L	LLL	G

DIRECTIONS (cont.):

4. Select the single highest Media Rating (A is highest; G is lowest) and enter the letter in the HHE Module Rating box below.

Note:
An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

HHE MODULE RATING	***G***

HHE Ratings (for reference only)	
Combination	**Rating**
HHH	A
HHM	B
HHL	C
HMM	C
HML	D
MMM	D
HLL	E
MML	E
MLL	F
LLL	*G*
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected MC Hazard

Table 29
MRS Priority

DIRECTIONS: In the chart below, circle the letter rating for each module recorded in Table 10 (EHE), Table 20 (CHE), and Table 28 (HHE). Circle the corresponding numerical priority for each module. If information to determine the module rating is not available, choose the appropriate alternative module rating. The MRS priority is the single highest priority; record this number in the MRS or Alternative Priority box at the bottom of the table.

Note: An MRS assigned Priority 1 has the highest relative priority; an MRS assigned Priority 8 has the lowest relative priority. Only an MRS with CWM known or suspected to be present can be assigned Priority 1; an MRS that has CWM known or suspected to be present cannot be assigned Priority 8.

EHE Rating	Priority	CHE Rating	Priority	HHE Rating	Priority
		A	1		
A	2	B	2	A	2
B	3	C	3	B	3
C	4	D	4	C	4
D	*5*	E	5	D	5
E	6	F	6	E	6
F	7	G	7	F	7
G	8			*G*	*8*
Evaluation Pending		Evaluation Pending		Evaluation Pending	
No Longer Required		No Longer Required		No Longer Required	
No Known or Suspected Explosive Hazard		*No Known or Suspected CWM Hazard*		No Known or Suspected MC Hazard	
MRS or ALTERNATIVE PRIORITY				*5*	

APPENDIX L – REFERENCE COPIES

Located on CD.

STAKEHOLDER RESPONSE TO COMMENTS

PROJECT: Draft Final SI Report for Gould Island (D01RI033803)			
		REVIEW: Draft Final SI Report for Gould Island DATE: 11 August 2009 NAME: Paul Kulpa, RIDEM	
ITEM	DRAWING NO OR REFERENCE	COMMENT	ACTION
1.	Section 3.3, Site Description and History, Page 3-1, Paragraph 1	"…air drop Mark II Torpedoes." Please include the following statement. In addition to test firing of air drop torpedoes in the waters off Gould Island, torpedoes were also test fired from submarines and from a test firing barge located on the eastern side of Gould Island. Test firing of torpedoes from the barge ceased when the test fire pier on the northern end of Gould Island became fully functional in 1943.	A-ACCEPTED/CONCUR - The following text was inserted and Section 2..11 (after the 4th sentence): "In 1921, two seaplanes were assigned to Gould Island to experiment with air-dropped Mark (MK) VII-2 torpedoes. In addition to test firing of air drop torpedoes in the waters off Gould Island, torpedoes were also test fired from submarines and from a test firing barge located on the northern side of Gould Island. Test firing of torpedoes from the barge ceased when the test fire pier on the northern end of Gould Island became fully functional in 1943 (Rhode Island Historical Preservation & Heritage Commission 1995)." The following reference has been added to the reference section "Rhode Island Historical Preservation & Heritage Commission. 1995. Historic and Architectural Resources of Jamestown, Rhode Island. http://www.jamestownri.com/library/history.htm"
2.	Section 3.3, Site Inspection Field Work. Page 3-4, Figure 3-1	Please modify Figure 3-1 to include the inspection and geophysical paths for the Torpedo Store House.	A-ACCEPTED/CONCUR - Upon review of the raw GIS tracks, Alion determined that there were additional tracks near the Torpedo Storehouse, which were not originally included in the figure. Figure 3-1 was revised in the Final SI Report to reflect all tracks covered.
3.	Section 2.4, Previous Investigations for Munitions Constituents and Munitions and explosives of Concern. Page 2.4.	This section of the report sites a number of historical investigations conducted at the site for military constituents. A review of the cited reports and summaries reveals that a number of the studies were limited to hazardous waste investigations. In addition, some of the studies were not associated with the areas MRS 1 or PAOI 1-4. As this is a public document, and in order to avoid confusion, it is recommended that the first sentence in Section 2.4.0.1 be modified as follows: A summary of previous historic investigations conducted on Gould Island is provided in the following sections.	A-ACCEPTED/CONCUR - The text was revised as follows and now reads "A summary of pertinent historical investigations at Gould Island is provided in the following subsections."

PROJECT: Draft Final SI Report for Gould Island (D01RI033803)			
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		If the intent is to list all investigations conducted at the site please be advised that additional investigations and/or remedial actions were conducted. The Office of Waste Management can provide information on these studies.	
4.	Section 2.1 Site Description and History Page 2-1, Paragraph 3.	This section of the report states that in 1941 the chief of Naval Operations denied a request for expansion of storage and subsequently all storage was transferred to Gould Island due to health and safety considerations. Section 4.1.3, Operational History Page 4-1. "After the beginning of WWII Bunker 11 was converted to a pistol range and Bunker 12 was converted into a store house." "The facility stored torpedoes during WWI and was transferred to inert torpedo storage during WWII." "The Magazine Igniter Storage Building was used for the storage of igniters, however, this usage likely changed in 1941 when war heads were removed from the site." The above statements from the cited different sections appear to be based upon a WWII interdepartmental memo which evaluated potential locations for the storage of war heads. The confusion may be due to the fact that the evaluation was for additional storage areas to meet the dramatic increases associated with war time production. The intent was not to replace or eliminate the storage on Gould Island. Be advised that a review of historical plans reveals that, Bunkers 11 and 12 are either listed as War Head Store House, Torpedo War Head Store House or Torpedo Store House in the 1942, 1943, 1948, 1950 and 1959 Gould Island United States Condition Maps. Therefore, please remove the above statements and other similar statements throughout the	N-NON-CONCUR – Descriptions of the PAOI's were obtained from the 1995 ASR report. Review of Conditions Maps provided by the Navy dated 30 June 1940, 30 June 1941, 30 June 1942, and 31 December 1942 show that Bunkers #11 and #12 remained as warhead storage. It was also noted that a U.S. Navy General Development Map for Gould Island, dated 1963, labels the bunkers as a "pistol range" and a "store house". These features can be observed on the table inset in the map titled "Existing". Additional figures use wording such as "Exercise Heads" which would agree with additional historical documents which specify "inert" warheads were tested at the site. Given the nature of the operations at the site, it is likely the storage of warheads was discontinued during WWII as the mission changed at this time. However, the exact date of this change was not found. Therefore, the fifth sentence of Section 2.1.3 has been revised as follows, "On an unknown date after 1941, the warheads were likely removed and Bunker 11 was subsequently converted to a Pistol Range for weapons qualifications for personnel stationed on the island. Bunker 12 was subsequently converted to a general storage bunker on an unknown date after 1941 (USACE 1995)."

PROJECT: Draft Final SI Report for Gould Island (D01RI033803)			
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		report and simply note that the bunkers were used as war head storehouses before, during, and after WWII.	
5.	Section 7.04, Recommendations and Conclusions Page 7-3,	(a) MRS 1 Nitroglycerin was found at concentrations above screening criteria. This is not a naturally occurring compound. It is not known whether this represents the highest concentration or whether it is up gradient, side gradient or down gradient of what ever contamination is present at the site. As this is a constituent related to military munitions, and as a torpedo carcass has been observed at this location in the past, RIDEM encourages the ACOE to recommend MRS 1 for the Remedial Investigation Stage so that it can be determined whether there is a concern for military constituents or not. (b) PAOI 1-4 It was noted that due to logistical constraints, such as, presence of brush and dense vegetation, and/or deteriorated buildings which were not safe to enter, inspection of PAOI 1, 2 & 4 was not possible (a portion of PAOI 3 was inspected). Accordingly, the ACOE was not able to ascertain if munitions or explosives of concern are present. In addition, due to the above factors, the ACOE did not collect environmental samples to ascertain if military related constituents are in the environment. The inability to inspect a site and/or not collect samples from a site does not justify the recommendation of NDAI. Either return to these sites to perform the SI or make a recommendation for remedial investigation to be performed. If safety issues and other logistics are a concern then the appropriate personnel should be obtained to conduct the necessary studies at the time of the RI.	(a) A-ACCEPTED/CONCUR - Consistent with USACE guidance USACE has indicated that there is an ongoing HTRW project which encompasses MRS 1. MC, to include explosives, will be addressed during the ongoing HTRW project. Furthermore, if MEC is found at the site during a later date (i.e. HTRW investigation or other investigations), then an MMRP project may be re-opened for this MRS which will address the findings of nitroglycerin. (b) N-NON-CONCUR – The PAOIs as identified and defined in the SI work plan and report were buildings designed for the controlled storage of munitions items. These PAOIs were not target areas, disposal areas, or open burn/open detonation areas. Furthermore, as stated in Sections 4.3.2 through 4.3.5 of the SI report, there have been no historical findings of MEC or MD by citizens, the Army or the Navy within these PAOI's. Historically, there have been no EOD reports provided or submitted concerning any of the PAOIs. Additionally, it was noted that the torpedo warheads originally stored in PAOI 1, were a highly classified and controlled item and that there was no chance of the U.S. Navy leaving a 326-lb warhead behind when the ceased warhead storage on the island. During the initial TPP meeting, the Alion Team agreed to perform additional reconnaissance in the areas encompassing the 4 PAOIs provided that the areas were accessible. During the SI field reconnaissance, it was determined that areas around some of the

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			PAOI or within the PAOIs were inaccessible due to thick vegetation or hazardous site conditions (i.e. dilapidated buildings which prevented safe entry). In accordance with USACE program guidance (Military Munitions Center of Expertise Interim Guidance Document (IGD) 07-04 dated 16 July 2007), it is neither necessary, nor encouraged, to investigate areas within the FUDS property boundary where munitions/ munitions constituents are not reasonably believed to be present. Alion agreed to look at these areas to try and resolve the questions raised by stakeholders; however, the history to date as documented in the WP does not support the need to further investigate these areas. Furthermore, the text reflects these findings and the PAOIs were recommended for an NDAI designation in accordance with USACE guidance and the findings to date. No changes to the text were made.