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October 13, 2017

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**Subject: Final Preliminary Technical Memorandum
Gould Island Site (D01RI033800)
Narragansett Bay, Rhode Island
Contract No. W912WJ-16-D-0007
Task Order No. W912WJ-17-F-0039**

Dear Mrs. Acone and Mr. Heislein,

The following Preliminary Technical Memorandum has been finalized based on comments received by the U.S. Army Corp of Engineers New England District (CENAE) on the draft submission on August 29, 2017, and subsequent calls and correspondence with the CENAE project team, particularly on the attached **Table 1**.

Credere Associates, LLC (Credere) has reviewed prior documents for the Gould Island Site located in Narragansett Bay, Rhode Island (Site) that were provided by CENAE and those provided by the Rhode Island Department of Environmental Management (RIDEM) central office in Providence, Rhode Island. This Final Preliminary Technical Memorandum summarizes pertinent prior documentation of work completed at the Site as required by the June 13, 2017, Performance Work Statement (PWS). This work was completed as a task order under the Hazardous, Toxic, and Radioactive Waste (HTRW) contract between the U.S. Army Corp of Engineers (USACE) and Credere. Certain documents referenced in previous reports were unavailable for review or never finalized. However, it is Credere's opinion that any additional information contained in those historical documents would not substantially alter the results of this Preliminary Technical Memorandum, as each subsequent investigation also included a historical review. For the sake of completeness, Credere will continue to attempt to locate, acquire, and review any further documentation that relates to the Scope of Work (SOW) of the task order.

The objective of this technical memorandum is to provide a concise description of prior work and preliminary data gap analysis to support a Project Coordination Meeting with CENAE and RIDEM to concur on Areas of Concern (AOC) for the Remedial Investigation and risk assessments needed for site closure. This technical memorandum and data gap analysis will be

updated with the results of the Project Coordination Meeting to produce a Final Technical Memorandum.

Site Description

The 39.15-acre Site is the southern portion of Gould Island that has been assessed under the Defense Environmental Restoration Program (DERP) and is eligible for funding as a Formerly Used Defense Site (FUDS). The 16.9-acre remainder of the island to the north is still owned by the U.S. Navy. The Site is currently heavily overgrown, however, remnants of dilapidated buildings, relict foundations, and bunkers that were formerly used in the storage, testing, and repair of torpedoes, research, housing, and infrastructure (e.g. power, heating, waste disposal, water treatment) are still present at the Site. The southernmost portion of the island has a large concrete pad and two dilapidated ramps formerly used by seaplanes (AST, 2009).

Site History

Beginning in 1887, a lighthouse was constructed for Narragansett Bay on the eastern side of the island (RIHPHC, 1995), and the island was otherwise used privately for residential purposes. Between 1918 and 1920, the island was seized by the United States for use by the U.S. Navy and Marines. Initial construction included adaptation of the existing residence for marine barracks, air hangars, a water tower and infrastructure, a personnel pier at the northern end of the island, a concrete torpedo pier at the southeast point of the island, a torpedo storage building, two warhead bunkers (later converted to a firing range and storage), the south powerhouse, and a railroad network for moving heavy equipment throughout the island. Torpedoes were test fired from seaplanes staged at the southern end of the Site and from an off-island barge. Test torpedoes were inert and used to test guidance and launching techniques only.

In the 1940s, additional buildings were rapidly constructed to support World War II including additional hangars, a second southern seaplane ramp, torpedo overhaul building, power station, additional barracks, Quonset huts, degaussing buildings, and the firing pier in the northern offsite portion of the island. Warheads were transferred to Prudence Island in 1941 due to safe distance limitations, and a pistol range was constructed at former Bunker 11. By 1943, the firing pier was in operation and approximately 65,000 unarmed torpedoes were tested from the firing pier, barges, and submarines by the end of World War II.

In the 1950s, testing and production of torpedoes was outsourced to private contractors (Envirodyne, 1983), and in 1975 and 1989, parcels were transferred to the State of Rhode Island to form the current 39.15-acre Site. The Site has been generally abandoned since and is heavily overgrown with vegetation. Public access to the Site is by permit only, and the Site has been designated as a bird sanctuary.

Summary of Prior Investigations

The following section summarizes pertinent Site history relative to specific prior reports, correspondence, or events. Referenced NED Site Nos. from an Engineering Evaluation of Contamination from 1997 (SWETS, 1997) were used throughout this memorandum for consistency and will be used going forward to reference specific AOCs.



Initial Assessment Study, Envirodyne Engineers, Inc., March 1983 (Envirodyne, 1983)

In 1983, an Initial Assessment Study (IAS) was completed for the Naval Education and Training Center (NETC) in Newport, Rhode Island, which included assessment of 16 potentially contaminated sites including Gould Island. The assessment identified the Gould Island Disposal Area 14, Bunker 11, and the offsite electroplating shop (not part of this FUDS project) as requiring further action.

In Disposal Area 14 (NED Site No. 10), approximately 200 yards of the western shoreline of the island was used to dispose of domestic trash, metal scrap, wood, pipes, rusted drums, diesel oil tanks, concrete blocks, electroplating wastes, and degreasing wastes (solvents); approximately 20 full drums were also noted at the time. Specific chemicals would have included muriatic acid, chromic acid, copper cyanide, sodium cyanide, sodium hydroxide, nickel sulfate, and anodex cleaner associated with electroplating operations. Reportedly, no wastes were transported back to Aquidneck Island from Gould Island, indicating all waste was disposed onsite. Due to the proximity to the bay and tidal action on the beach, these materials could migrate and be transported out into the bay.

In Bunker 11 (NED Site No. 21), at least 10 unlabeled drums and other possible buried drums beneath the collapsed room were present. Surface drainage from this area discharged directly to the bay.

Based on the above, the following was recommended as part of a Confirmation Study:

- Collect four sediment samples plus two background samples to 3 feet below the bay bed in approximately 20 feet of water along Disposal Area 14 and analyze for polychlorinated biphenyls (PCBs) and metals (cadmium, chromium, copper, lead, mercury, nickel, and silver)
- Sample the contents of the drums in Disposal Area 14 in accordance with Resource Conservation and Recovery Act (RCRA)/RIDEM regulations for disposal
- Characterize the contents of the drums in Bunker 11 in accordance with RCRA/RIDEM regulations for disposal and properly dispose offsite

Investigation and Removal of Hazardous Waste on Gould Island, July 1983 (RIDEM, 1983a and 1983b)

In July 1983, RIDEM completed a Site inspection and identified numerous drums and other containers throughout the island for disposal (RIDEM, 1983a). On July 19, 1983, the following was removed (RIDEM, 1983b):

- Two (2) waste oil 55-gallon drums from outside the hangar (possibly Site Nos. 28 or 29)
- Five (5) 5-gallon cans of grease paint and solvents from the pump house (possibly NED Site No. 4)
- Three (3) 55-gallon drums of solvent from Bunker 11 (NED Site No. 21)



- Two (2) 55-gallon drums of paint sludge and one (1) 55-gallon drum of waste oil from the top of Bunker 11 (NED Site No. 21)
- Ten (10) 5-gallon cans of solvents from Building 10 (former torpedo storage building, NED Site No. 38)
- Two (2) 275-gallon ASTs of diesel, three (3) 55-gallon drums of waste oil, and 10-15 empty drums from the incinerator building (NED Site No. 8)
- Five (5) 5-gallon cans of solvents, oil, and grease from Building 34 (theatre and research building, NED Site No. 34)
- Five (5) 5-gallon cans of oil and grease from Building 12 (maintenance garage, NED Site No. 12)
- One (1) 55-gallon drum of waste oil and one (1) pH-14 sodium hydroxide drum (unknown Site No.)
- One (1) transformer from Vault 25A (NED Site No. 17)

Additionally, numerous acetylene, propane, and air cylinders were removed.

Confirmation Study Report, May 15, 1986 (Loureiro, 1986)

The Confirmation Study was conducted to assess the extent of previously identified impacts in Disposal Area 14 (NED Site No. 10) extending into adjoining sediment within the bay. Sediment and mussels were sampled for PCBs and metals. Results indicated elevated levels of metals – particularly lead, chromium, nickel, and copper – in near-shore sediments, and copper and lead in mussels above control sample results. Results are summarized in **Table 2**, and sample locations are provided on **Figure 1**.

UST Removals, 1989-1990

On February 13, 1989, the Department of the Navy (DoN) notified RIDEM of the planned removal of the following USTs from the Site (DoN, 1989a):

- Unknown volume Tank NUSC 1 from Building 23 (gas pump house, NED Site No. 26)
- Unknown volume Tank NUSC 2 from Building 23 (gas pump house, NED Site No. 26)
- 5,000-gallon steel tank from Building 39 (maintenance, garage, and fire station, NED Site No. 12)

The letter also included notification of removal for seven other USTs from the offsite Navy portion of Gould Island that are not discussed further. RIDEM responded with a letter dated March 1, 1989, indicating the need for a closure application, a sampling plan, and compliance with the Division of Air and Hazardous Materials (RIDEM, 1989), which DoN provided on September 19, 1989 (DoN, 1989b).

According to a field investigation report prepared by RIDEM (RIDEM, 1990), the tanks were removed. RIDEM collected samples from three monitoring wells at that time; however, no



results were available for review (it is not known if these wells were onsite or associate with the offsite USTs on the Navy parcel). Historical correspondence indicates the closure reports prepared in accordance with RIDEM requirements were completed; however, were used during litigation in Philadelphia and were never returned to the permanent record file. These reports have not since been located, but will be required to confirm the USTs were removed according to RIDEM requirements and that no residual contamination remained.

Chemical Data Acquisition Plan (ABB/SWETS, 1994), November 1994, and Engineering Evaluation of Contamination (SWETS, 1997), July 1997

In 1994, Stone and Webster Environmental Technology and Services (SWETS) reviewed available records for the Site with USACE, the Naval Education and Training Center (NETC), and RIDEM, as well as historical aerial photographs and Site plans. Based on this review, SWETS identified three primarily areas of concern in their Chemical Data Acquisition Plan (CDAP): Disposal Area 14, Bunker 11, and the offsite electroplating shop (located offsite on the Navy parcel and not considered part of the FUDS Site). The plan also identified 47 total onsite areas to be assessed as part of an Engineering Evaluation of Contamination, which are listed in **Table 1**.

In December 1994, SWETS and ABB Environmental Services (ABB) conducted a visual Site inspection, geophysical magnetometry survey, and surface/near surface soil sampling. Results of this investigation specific to each identified area of concern (AOC) are summarized in **Table 1**.

The investigation identified underground storage tanks (UST), 55-gallon drums and smaller chemical containers, transformers, remnant torpedo parts, compressed gas tanks, universal waste, residual coal, and general debris from former structures. Sampling results indicated contaminated soil in several areas. Contaminants of potential concern (COPC) that were detected above U.S. Environmental Protection Agency (USEPA) and/or RIDEM soil screening criteria (not applicable to FUDS sites, except in the case of certain UST related assessment) were semi-volatile organic compounds (SVOCs), polycyclic aromatic compounds (PAH), arsenic, lead, chromium, nickel, total petroleum hydrocarbons (TPH), and PCBs. A summary of soil analytical results is provided in **Table 3**, and sample locations are shown on **Figure 1**.

Ordnance and Explosive Waste Archives Search Report, July 1995 (USACE, 1995)

In 1994, a historical records search and Site inspection was conducted under DERP to evaluate the Site for any ordnance and explosive waste (OEW). Sub-areas of the Site were classified into three categories with respect to OEW: confirmed, potential, and uncontaminated. The findings from the visual inspection and archives review concluded the Site is considered uncontaminated for OEW with the exception of Disposal Area 14 (NED Site No. 10), which was categorized as having the potential for OEW. Disposal Area 14 was the primary dump site on Gould Island while in operation. Ordnance most likely to be disposed in this area were ignitors, 1.1-inch rounds, and pyrotechnics. A torpedo propeller section and shaft were visible, though, as stated previously, none of the torpedoes on the island were armed for testing. The former Ordnance Test Facility/Hanger (NED Site No. 28), Hangar 5496-61 (NED Site No. 29), and Pyrotechnic Storage Building area (NED Site No. 30) are considered uncontaminated as they were washed



out to sea in 1985 during Hurricane Bob and there is no visual evidence to indicate OEW. Any remaining spent casings from the pistol range at Bunker 11 are not considered OEW, but may represent an environmental concern for metals contamination in Site soils.

Draft Baseline Risk Assessment Workplan, March 1998 (SWETS, 1998a)

In 1998, SWETS completed a Draft Baseline Risk Assessment Workplan and Site Health and Safety Plan to support the Phase II Engineering Evaluation of Contamination for the Site. The document presents proposed data gap sampling locations for human health and ecological risk assessment. Additionally, a Site Health and Safety Plan (SWETS, 1998b) and an Environmental Compliance Summary for Field Activities (SWETS, 1998c) were completed. Correspondence from June 24, 1998, indicated a significant scope modification due to Site constraints would occur. Based on review of records, this scope modification **did not occur and the Phase II Engineering Evaluation of Contamination was never completed.**

Final Site Inspection Report for Gould Island, August 2009 (Alion, 2009)

Alion Science and Technology (Alion) completed a Site Inspection (SI) in accordance with their Site-Specific Work Plan (SSWP) Addendum (Alion, 2008) dated November 2008. The objective of the SI was restricted to assessment of munitions and explosives of concern (MEC) and munitions constituents (MC) under the Military Munitions Response Program (MMRP) and did not assess the need for response actions under FUDS, the need for a Time Critical Removal Action (TCRA), collect data for a Hazard Ranking System (HRS) score, nor characterizes wastes for initiation of a Remedial Investigation/Feasibility Study.

In December 2008, analog geophysics and visual observation were completed at the island in Disposal Area 14 (MRS-1; NED Site No. 10), Bunkers 11 and 12 (potential area of interest [PAOI]-1; NED Site Nos. 21 and 22, respectively), the torpedo storehouse (PAOI-2; NED Site No. 38), the north and south gun mounts (PAOI-3, NED Site No. 46), and the magazine ignitor storage area (PAOI-4; NED Site No. 9). No evidence of MEC or MC was observed in any of the PAOIs; therefore, no sampling was conducted. Several soil and sediment samples were collected from Disposal Area 14 (MRS-1) and analyzed for explosives. Nitroglycerin was detected in one soil sample.

Based on the low risk considering the absence of a source, stable environment, limited access to the island, and limited exposure frequency, Alion recommended closure of the MMRP project as the identified nitroglycerin would be assessed and addressed as part of the ongoing HTRW project.

DERP FUDS MMRP Closeout Letter of Non-Concurrence, RIDEM, September 17, 2014 (RIDEM, 2014)

In response to USACE's September 11, 2014, letter requesting a No Department of Defense Action Indicated (NDAI) for the Site, RIDEM issued a letter of non-concurrence and identified the following areas that remained to be assessed:

1. Extent of nitroglycerin in Disposal Area 14 (NED Site No. 10)



2. Location of previously observed, but recently missing, torpedo carcass
3. Bunkers 11 and 12 (NED Site No. 21 and 22, respectively)
4. Torpedo Storehouse (NED Site No. 38)
5. North and South Gun Mounts (NED Site No. 46)
6. Magazine Ignitor Storehouse (NED Site No. 9)

Data Gap Analysis

Based on the above summary of prior investigations, Credere prepared a data gap analysis that is attached as **Table 1**. The data gap analysis was prepared by reviewing prior investigations relative to previously identified AOCs, compiling prior analytical data, comparing analytical data to current comparison criteria, and then assessing the need for additional investigations or data. These findings will be discussed with the project team at the Project Coordination Meeting, and recommendations will be incorporated into the Remedial Investigation Workplan, which consists of a Quality Assurance Project Plan (QAPP) and Field Sampling Plan (FSP). The objective of the work outlined in the QAPP/FSP will be to support a Remedial Investigation to include a Human Health and Ecological Risk Assessment. In preparing the QAPP/FSP, statistical defensibility with respect to hypothesis tests for site versus background, sample density and representation, and laboratory measurement quality objectives will be considered.

Please do not hesitate to contact me at (207) 828-1272 ext. 20 if you have any questions.

Sincerely,
Credere Associates, LLC



Sean McNamara
Project Manager/Engineer

CC: Rip Patten, PE, Credere Associates, LLC
Allison Drouin, PG, CG, Credere Associates, LLC

Attachments: Figure 1 – Detailed Site Plan
Table 1 – Comprehensive Data Gap Analysis
Table 2 – Summary of Historical Sediment Analytical Results
Table 3 – Summary of Historical Soil Analytical Results



LIST OF ACRONYMS

AOC – area of concern
CDAP – Chemical Data Acquisition Plan
CENAE – Corps of Engineers New England Division
COPC – contaminant of potential concern
DERP – Defense Environmental Restoration Program
DoN – Department of the Navy
FSP – Field Sampling Plan
FUDS – Formerly Used Defense Site
HRS – Hazard Ranking System
HTRW – Hazardous, Toxic, and Radioactive Waste
IAS – Initial Assessment Study
MC – munitions constituents
MEC – munitions and explosives of concern
MMRP – Military Munitions Response Program
NDAI – No Department of Defense Action Indicated
NETC – Naval Education and Training Center
OEW – ordnance and explosive waste
PAH – polycyclic aromatic hydrocarbons
PAOI – potential area of interest
PCBs – polychlorinated biphenyls
PWS – Performance Work Statement
QAPP – Quality Assurance Project Plan
RCRA – Resource Conservation and Recovery Act
RIDEM – Rhode Island Department of Environmental Management
SI – site inspection
SSWP – Site-Specific Work Plan
SVOC – semi-volatile organic compound
TCRA – Time Critical Removal Action
TPH – total petroleum hydrocarbons
USACE – U.S. Army Corps of Engineers
USEPA – U.S. Environmental Protection Agency
UST – underground storage tank
VOC – volatile organic compound



REFERENCES

ABB, 1994. *Final Chemical Data Acquisition Plan, Engineering Evaluation of Contamination, Former Naval Testing Facility, Gould Island*. Prepared for USACE New England District. ABB Environmental Services, Inc. December 1994.

Alion, 2009. *Final Site Inspection Report*. Prepared for USACE New England District. Alion Science and Technology. August 2019.

Envirodyne, 1983. *Final Initial Assessment Study of the Naval Education and Training Center*. Prepared for the Naval Assessment and Control of Installation Pollutants Department. Envirodyne engineers, Inc. March 1983

Loureiro, 1986. *Confirmation Study report on Hazardous Waste Sites*. Prepared for Northern Division, Naval Facilities Engineering command. May 1986.

RIDEM, 1983a, b. *Investigation and Removal of Hazardous Waste on Gould Island*. Rhode Island Department of Environmental Management (RIDEM). 1983.

RIDEM, 2014. Letter: *DERP FUDS MMRP Closeout Letter of Non-Concurrence*. Rhode Island Department of Environmental Management (RIDEM). September 17, 2014.

SWETS, 1997. *Final Interim Report Engineering for Evaluation of Contamination*. Prepared for USACE New England District. Stone & Webster Environmental Technology and Services. July 1997.

SWETS, 1998a. *Draft Baseline Risk Assessment Workplan*. Prepared for USACE New England District. Stone & Webster Environmental Technology and Services. March 1998.

USACE, 1995. *Findings on Ordnance and Explosive Waste for Former Naval Torpedo Testing Facility at Gould Island*. USACE. July 1995.





LEGEND					
NED SITE NUMBER	LOCATION	NED SITE NAME	NED SITE NUMBER	LOCATION	NED SITE NAME
1	D-4	COAL STORAGE	26	C-13	GAS PUMP HOUSE/GAS TANKS (REMOVED)
2	B-5	MARINE BARRACKS (FOUNDATION REMAINING)	27	D-14	TWO GAS PITS
3	C-5	FORMER CARPENTERS SHOP	28	D-13	FORMER ORDNANCE TEST FACILITY, HANGER
4	E-9	PUMP HOUSE	29	D-14	FORMER UNKNOWN BUILDING #1 (HANGAR 5496-61)
5	E-7	FORMER UNKNOWN BUILDING #2	30	E-14	FORMER PYROTECHNIC STORAGE
6	E-10	UNKNOWN BUILDING #3	31	E-13	GAS PIT
7	D-5	FORMER UNKNOWN BUILDING #4 (FOOTINGS REMAINING)	32	E-12	FORMER DRUM STORAGE AREA
8	E-7	INCINERATOR	33	D-13	FORMER PAINT AND OIL STORAGE
9	E-6	MAGAZINE IGNITOR STORAGE	34	D-12	THEATER/RESEARCH BUILDING (FOUNDATION REMAINING, CONCRETE PLATFORM)
10	E-8	DISPOSAL AREA #14	35	D-12	BOILER HOUSE
11	C-6	FORMER QUONSET HUTS/MAINTENANCE SHOPS	36	D-11/12	DEGAUSSING BUILDING
12	C-7	MAINTENANCE SHOPS/GARAGE/FIRE STATION	37	D-11	MISCELLANEOUS STORAGE
13	B-8	ELECTRIC SUBSTATION TRANSFORMER PEN	38	D-11/12	STORAGE
14	C-8	FORMER MARINE BARRACKS	39	D-6	WELLHOUSE #81
15	C-9	FORMER RECREATION BUILDING	40	D-9	WELLHOUSE #78
16	C-9	FORMER BARRACKS	41	D-8	AA GUNS ELECTRICAL SUPPLY (UTILITY POLE REMAINING)
17	C-9	FORMER TRANSFORMER VAULT	42	D-14	5,000 GALLON AVGAS TANK
18	D-10	WATER TREATMENT PLANT	43	D-13	FORMER PAINT SHED
19	D-9	TORCH POT STORAGE	44	D-14	EMPTY DRUMS
20	B-6	FORMER CABLE TERMINAL BUILDING	45	D-8	FORMER FIRE APPARATUS HOUSES (2)
21	B-11	BUNKER #11	46	D-7, D-8, E-7, E-8	FORMER AA GUN EMPLACEMENTS (4)
22	B-12	BUNKER #12	47	C-10	UNDERGROUND WATER TANK
23	C-12	COAL STORAGE	48A	C-13	BACKGROUND SAMPLE #1 LOCATION
24	B-12	CABLE TERMINAL BUILDING	48B	D-7	BACKGROUND SAMPLE #2 LOCATION
25	B-12	UNDERGROUND STORAGE TANKS			

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FIGURE 1

DETAILED SITE PLAN

GOULD ISLAND
NARRAGANSETT BAY
JAMESTOWN, RHODE ISLAND

10

NED SITE NUMBER



PREVIOUS SEDIMENT SAMPLE LOCATION (STONE AND WEBSTER, 1997)



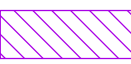
PREVIOUS SOIL SAMPLE LOCATION (STONE AND WEBSTER, 1997)



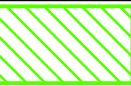
HISTORICAL EDGE OF ROADWAY



AREA REQUIRING FURTHER INVESTIGATION/CLEARING



RIDEM/F&W DESIGNATED CRITICAL AVIAN HABITAT



US NAVY EASEMENTS / NON-FUDS ELIGIBLE



HISTORICAL STRUCTURES



DISPOSAL AREA 14



APPROXIMATE SITE BOUNDARY



APPROXIMATE PARCEL BOUNDARY

NOTES:
EXISTING CONDITIONS FEATURES SHOWN ON THIS PLAN ARE APPROXIMATE AND ARE BASED ON INFORMATION OBTAINED FROM RHODE ISLAND GIS, US COAST GUARD, AND ENGINEERING EVALUATION OF CONTAMINATION FORMER NAVY TORPEDO TESTING FACILITY BY STONE & WEBSTER ENVIRONMENTAL TECHNOLOGY & SERVICES.

Table 1
Comprehensive Data Gap Analysis
Gould Island (D01RI033800)
Narragansett Bay, Rhode Island

NED Site No.	Navy Structure Name/No./Building Description	Comments From 1994 Records Review (SWETS, 1997)	Visual Site Inspection Results (SWETS, 1997; Alion 2009)	Prior Investigation Sampling Results (SWETS, 1997; Alion 2009)	Credere Identified Data Gaps and Possible COPCs
1	Coal Storage	Coal pile shown on 1943 aerial photos. Labeled “coal” on 1945 site plan. Not present on 1919, 1942, 1943, 1957, or 1963 site plans.	Surface soil contains pieces of coal and coal dust. Vegetation sparse relative to surrounding area.	One aliquot-composite sample collected for TPH, SVOC, and RCRA metals analysis. PAHs, arsenic, chromium, and TPH detected in surface/near surface soils with PAHs exceeding current comparison criteria. Concentrations of two SVOCs and arsenic exceeded RIDEM soil screening levels.	1. Horizontal and vertical extent of coal in soil by visual examination. 2. Nature and extent of previously identified contamination. 3. PAHs, arsenic, chromium, and TPH.
2	Marine Barracks	Shown on 1945 site plan. Not shown on 1919, 1942, 1943, 1957, or 1963 site plans. Not discernable on 1942/1943 aerial photos. No indication of USTs or other contamination sources on plans or aerial photos.	Structure no longer standing. Concrete foundation for building present. Possible UST pipes found. Other pipes located appear to discharge to the Bay. No evidence of stressed vegetation.	No evidence of USTs by geophysical survey (metal detection). No stressed vegetation or discolored soil. Location not sampled.	No further action.
3	Carpenter’s shop	Shown on 1943 aerial photos. Present on 1943 site plan and 1945 site plan. Not shown on 1919, 1942, 1957, or 1963 site plans.	Evidence of site could not be found. No evidence of stressed vegetation.	Records provide no indication of contamination sources. No visual evidence of site or stressed vegetation. Location not sampled.	No further action.
4	Pump House	Pipeline labeled salt water on July 17, 1942, drawing “1.10.A.A Machine Gun Emplacements – Electrical, PW Drawing No. 5406-61”.	Small building on coast, still standing. Several empty, rusted 5-gallon containers were present. No evidence of stressed vegetation.	Drawings indicate facility was a saltwater pumphouse. No evidence of USTs, transformers, discolored soil or stressed vegetation. Location not sampled.	1. Remove empty 5-gallon containers from the island. Sample under cans for confirmatory sampling to satisfy AOC risk assessment/closure. 2. VOCs, SVOCs, TPH, PCBs, and metals.
5	Unknown BLDG #2	Unknown structure (tent?) on 1943 aerial photos. Dark soil shown in vicinity on August 1943 aerial photo. Not shown on any site plans.	Structure not found. Building debris located. No surficial evidence of contamination, USTs, or stressed vegetation.	Records provide no indication of potential contamination sources. No surficial evidence of contamination, USTs or stressed vegetation. Location not sampled.	No further action.
6	Unknown BLDG #3	Shown on 1943 aerial photos. Unknown structure (tent?). Not shown on any site plans.	Structure not found. Retaining wall and wooden poles mark site. No debris. No surficial evidence of contamination, USTs, or stressed vegetation.	Records provide no indication of potential contamination sources. No visual evidence of USTs, stained surface soil or stressed vegetation. Location not sampled.	No further action.
7	Former Unknown BLDG #4	Undefined (apparent) construction activity on 1943 aerial photos. Labeled as “Shed” on 1919 site plan. Also shown on above-referenced 1943 and 1945 site plans (but unlabeled). Not present on 1957 or 1963 site plans.	Structure no longer standing. Pieces of concrete mark site remnants of foundation. No surficial evidence of contamination, USTs, or stressed vegetation.	No visual or geophysical (metal detection) indication of USTs. No evidence of surficial stained soils or stressed vegetation. Location not sampled.	No further action.
8	Incinerator #49	Not shown on 1919 site plan. Building shown on 1943 plan and subsequent (1945, 1957, and 1963) site plans. Located adjacent to disposal area (NED Site 10).	Structure still standing. Located valve possibly for a pipe or tank. Approximately 15 empty, rusted 5-gallon pails were present outside the building on a concrete surface. No other surficial evidence of potential contamination or stressed vegetation.	Records provide no indication of potential contamination sources. No geophysical evidence of USTs. Location of pipe traced using geophysics consistent with water line shown on plan. Location not sampled.	1. Removal of empty 5-gallon containers from the island. 2. Assessment of incinerator structure, floor, and perimeter soil. 3. Dioxins, furans, PAHs, metals, and PCBs.
9	Magazine Ignitor Storage #37	Building shown on 1943 aerial photos. Shown on June 1943 plan, and subsequent drawings. Not shown on 1919 or 1942 plans.	Evidence of building could not be found. No evidence of stressed vegetation.	No visual evidence of building or stressed vegetation. Location not sampled.	1. GPR survey to screen for anomalies 2. Assessment of soil and groundwater to satisfy AOC risk assessment/closure. 3. SVOCs, explosives, VOCs, PCBs, TPH, and metals.

Table 1
Comprehensive Data Gap Analysis
Gould Island (D01RI033800)
Narragansett Bay, Rhode Island

NED Site No.	Navy Structure Name/No./Building Description	Comments From 1994 Records Review (SWETS, 1997)	Visual Site Inspection Results (SWETS, 1997; Alion 2009)	Prior Investigation Sampling Results (SWETS, 1997; Alion 2009)	Credere Identified Data Gaps and Possible COPCs
10	Disposal Area #14	1983 (Envirodyne, 1983) and 1986 (Loureiro, 1986) reports indicate use from the World War II era until approximately the early 1950s. No waste known to have been transported back to mainland and was all disposed here. Possible outfall from electroplating building reported. Not shown on any site plans. Filling not discernable on 1942 or 1943 aerial photos.	Large amounts of metal, concrete, and wood debris located in several areas. Incinerator/boiler slag and several (rusted) torpedo drive-sections also identified. Two areas, each containing several empty, rusted 55-gallon drums (approximately 10 total), found on top of area. Portions of the open face of disposal area are in contact with Bay at high tide.	One composite soil sample collected near drums was analyzed for TPH, VOC, SVOC, pesticides, PCBs, RCRA metals, and cyanide. One additional sample collected due to one additional area of drums identified on the ground surface and was analyzed for TPH, VOC, SVOC, pesticide, PCB, RCRA metals, explosives, nitroglycerin, and cyanide. Nitroglycerin, PAHs, lead, chromium, and arsenic detected at concentrations higher than at least one of the current comparison criteria. Highest concentration previously detected. Lead, chromium, nickel, and copper above background control sample results in sediment and lead and copper in mussel tissue samples. Some prior sediment results exceed the current marine TEL/PEL. Extent of the disposal area was previously determined by magnetometry.	1. Vertical delineation of waste onshore. 2. Assessment of nature and extent of previously identified contamination including soil, groundwater, and sediment into the bay. 3. Removal of containers and solid waste. 4. Identify possible outfall from the electroplating building. 5. Explosives, nitroglycerin, VOCs, SVOCs, TPH, pH, priority pollutant metals.
11	Former Quonset Huts/Maintenance Shops	Shown on 1943 aerial photos. Shown on 1943 site plan. Fewer Quonset huts shown on 1945 site plan. Labeled as “Maintenance Shop” and “Heating Plant” on 1957 site plan. Not present on 1919, 1942, or 1963 site plans.	Structures no longer standing. Building and other debris, including wood, nails, and roofing materials found. No surficial evidence of contamination, USTs, or stressed vegetation.	No geophysical (metal detection) evidence of USTs. Location not sampled.	1. Soil and groundwater assessment for use as a maintenance and heating plant. 2. VOCs, SVOCs, TPH, and metals.
12	Maintenance Shop/Garage/Fire Station #39	Buildings not shown on 1919 site plan. Northernmost building shown as “Under Construction” on 1942 site plan. Northernmost structure shown on 1943 aerial photos and 1943 site plan. Eastern and southern attached buildings shown on 1945 site plan and subsequent plans. RIDEM records suggest a 5,000-gallon fuel oil UST was removed from southwest of the building.	Structures still present. Southernmost building collapsed. Possible UST vent pipe found on north side of northernmost building. Oil-fired boiler, manhole for electrical utilities, transformer with spilled contents, and maintenance pit in concrete floor located inside buildings. Sparse vegetation relative to surroundings observed in area of possible former UST southwest of the buildings at Site 12.	No prior data or confirmatory assessment associated with UST removal. Location not sampled. Magnetometer survey identified suspect additional UST anomaly unassociated with previously removed UST.	1. Possible additional UST northwest of building that would require assessment. Confirm with GPR survey. 2. Assessment of spilled transformer contents and impacted media for PCBs. 3. Assessment of vehicle maintenance pit contents despite concrete bottom for TPH, VOCs, SVOCs and metals. 4. General assessment for PFAS related to fire station. 5. Previously removed USTs were removed by the Navy and, therefore, are not covered under FUDS.
13	Electric Substation/Transformer Pen #43	Building and fenced transformer pen shown on 1942 site plan and subsequent site plans. Cannot tell if present on 1943 aerial photos.	Fence and adjacent building still standing. Former transformer pads present. Transformers not present. One empty, rusted 5-gallon pail found on ground surface. No other surficial evidence of contamination, USTs, or stressed vegetation.	Two soil samples collected to evaluate soil associated with former transformers and were analyzed for TPH, PCB, and RCRA metals. PCBs detected below RIDEM soil screening levels but above EPA RSLs in surface soil samples. TPH, arsenic, chromium, and lead detected at concentrations exceeding current comparison criteria.	1. Removal of empty 5-gallon container from island and sample soil in vicinity of container. 2. Nature and extent of previous identified contamination. 3. PCBs, TPH, and RCRA 8 metals.
14	Former Marine Barracks	Not shown on 1919 site plan. Building shown on 1943 aerial photos. Shown on the “Gould Island Conditions, 1949” site plan as “Residence,” and on the 1943 site plan, but is not present on subsequent (1945, 1957, 1963) site plans. “Concrete Platform” shown on 1957 and 1963 site plans to south.	Evidence of building could not be found.	Records provide no indication of contamination sources. No evidence of site or stressed vegetation could be found. Location not sampled.	No further action.

Table 1
Comprehensive Data Gap Analysis
Gould Island (D01RI033800)
Narragansett Bay, Rhode Island

NED Site No.	Navy Structure Name/No./Building Description	Comments From 1994 Records Review (SWETS, 1997)	Visual Site Inspection Results (SWETS, 1997; Alion 2009)	Prior Investigation Sampling Results (SWETS, 1997; Alion 2009)	Credere Identified Data Gaps and Possible COPCs
15	Former Recreation Building	It is not present on earlier (1919, 1942, and 1943) site plans, or in the 1942 and 1943 aerial photos. Building first appears on the 1945 site plan. It is not present on the 1957 or 1963 site plans.	Evidence of building could not be found.	Records provide no indication of contamination sources. No evidence of site or stressed vegetation could be found. Location not sampled.	No further action.
16	Former Barracks	Buildings are present in 1943 aerial photos. The easternmost building is present, and the westernmost building is shown as under construction in the 1942 site plan. The buildings are shown as present on the 1943 and 1945 site plan. The buildings are shown as present on the 1943 and 1945 site plans, but are not present on the 1919 or the 1957 and 1963 site plans.	Structures no longer standing. Concrete platform present. Transformers partially buried due north of Site 16 in small mounds of soil. No other surficial evidence of contamination or USTs. Sparse vegetative growth near transformers relative to surroundings.	No geophysical (metal detection) anomalies indicative of USTs. Location not sampled.	1. Removal of transformers from the island and soil assessment to satisfy AOC risk assessment/closure. Transformers in separate location relative to Transformer Vault. 2. PCBs and TPH.
17	Former Transformer Vault #25A	The building is not shown on the 1919, 1942, 1943, and 1945 site plans, and is not shown on the 1942/1943 aerial photos. Building is shown on the 1957 and 1963 site plans.	Evidence of building could not be found.	No evidence of site or stressed vegetation could be found. Location not sampled.	Navy Easement – Not FUDS eligible. No further action.
18	Water Treatment Plant #42	Building is not present in the January 1943 aerial photo, is under construction in an April 1943 aerial photo, and is present in August 1943 aerial photo. Consistent with the above, it is not shown on the 1919 and 1942 site plans, but is shown on the 1943 site plan and subsequent (1945, 1957, and 1963) site plans.	Building still standing. Tanks in building empty and clean. No surficial evidence of contamination, USTs, or stressed vegetation found.	Treatment tanks in building empty and clean. No evidence of USTs, surficial soil contamination, or stressed vegetation. Location not sampled.	Navy Easement – Not FUDS eligible. No further action.
19	Torch Pot Storage #51	Building under construction shown on the January 1943 aerial photo and is present on the August 1943 aerial photo. The building is shown as scheduled for construction on the 1942 site plan, and is present on the 1943, 1957, and 1963 site plans.	Standing three-walled concrete structure without roof present. One empty, rusted 30-gallon drum marked “Low Pressure Hexane Vapor” found. No other surficial evidence of contamination, USTs, or stressed vegetation.	One soil sample collected near drum was analyzed for TPH and VOC. No visual indication of surficial soil contamination or stressed vegetation. No VOCs detected in surface soil beneath drum. TPH in surface soil beneath drum below RIDEM soil screening levels.	1. Removal of empty drum from the island. 2. Confirmatory soil sampling after removal. If no drum is currently identified, no sampling is warranted based on prior data. 3. VOCs and TPH.
20	Former Cable Terminal BLDG #87	Not present on prior (1919, 1942, and 1943) site plans. Not apparent on 1942/1943 aerial photos. Building first appears on 1957 site plan, and is also shown on 1967 site plan.	Structure no longer standing. Single utility pole at site. No surficial evidence of contamination, USTs, or stressed vegetation.	Records provide no indication of contamination sources. No visual evidence of USTs, surficial soil contamination, or stressed vegetation. Location not sampled.	No further action.
21	Bunker #11	First appears on 1919 site plan, with railroad tracks extending to/from torpedo storehouse (NED Site 38) and pier at southeast corner of island. Railroad lines no longer apparent on 1943 site plan or 1943 aerial photo. Building behind (west of) each bunker retaining wall constructed of wood. Used for warhead storage through 1941; pistol shooting range thereafter.	Superstructure still present, badly deteriorated. Wood building no longer present. Contains variable debris, including numerous (approximately 20 or more) empty, rusted 55-gallon drums and 5-gallon containers. Torpedo mid-section present beneath debris. No evidence of surficial contamination or USTs found. Vegetation sparse near some drums and containers than surrounding areas. Some drums under debris not readily accessible.	Two composite soil samples collected near drums were analyzed for TPH, VOC, RCRA metals, explosives, and nitroglycerin TPH, arsenic, chromium and lead concentrations exceeding current comparison criteria. A torpedo section was found that the Navy EOD Unit determined poses no explosion hazard.	1. Visible and buried containers and solid waste beneath collapsed structure require removal. 2. Nature and extent of previously identified contamination in soil and groundwater. 3. TPH, RCRA 8 metals, and assess for PCBs, explosives, VOCs, SVOCs, and pesticides.

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Gould Island (D01RI033800)
Narragansett Bay, Rhode Island

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22	Bunker #12	First appears on 1919 site plan, with railroad tracks extending to/from torpedo storehouse (NED Site 38) and pier at southeast corner of island. Railroad lines no longer apparent on 1943 site plan or on August 1943 aerial photo. Building behind (west of) each bunker retaining wall constructed of wood.	Structure still present, badly deteriorated. Contains variable debris, including numerous (up to 30 or more) empty, rusted 55-gallon drums and 5-gallon containers. No evidence of surficial contamination or USTs found. Vegetation sparse near some drums and containers relative to surrounding area.	Two composite soil samples collected near drums were analyzed for TPH, VOC, RCRA metals, explosives, and nitroglycerin. Lead, chromium and arsenic were detected at concentrations exceeding current comparison criteria.	1. Visible and buried containers and solid waste beneath collapsed structure that requires removal. 2. Nature and extent of previously identified contamination in soil and groundwater. 3. RCRA 8 metals and assess for PCBs, VOCs, SVOCs, pesticides, explosives.
23	Former Coal Storage	Coal pile shown on 1943 aerial photos. Labeled “Coal” on 1945 site plan. Not present on 1919, 1943, 1957, or 1963 site plans.	Surface soil contains pieces of coal and coal dust. Vegetation sparse relative to surrounding area.	One composite soil sample from two locations previously staked was analyzed for TPH, SVOC, and RCRA metals. PAHs, arsenic, chromium and TPH detected in surface /near surface soils with PAHs arsenic and chromium exceeding current comparison criteria	1. Horizontal and vertical extent of coal in soil by visual examination. 2. Nature and extent of previously identified contamination in soil for SVOCs, RCRA 8 metals and TPH.
24	Cable Terminal BLDG #16	Building appears at this location on 1919, 1942, 1943, and 1945 site plans, labeled “Waiting Room.” Same structure labeled “Fresh Water Pump House” on 1957 site plan, and “Hydrophone Cable Terminal Building” on 1963 site plan. Building present in 1943 aerial photos.	Structure still standing. One empty, rusted 55-gallon drum found. Concrete pad at site (possible former transformer pad?). No other surficial evidence of contamination, USTs, or stressed vegetation.	One composite soil sample collected near drums and pad was analyzed for TPH, PCB, and VOC. PCBs and TPH were detected in surface/near surface soil samples collected near probable former transformer pad and an empty, rusted 55 gallon drum. The TPH and PCB concentrations were less than the current comparison criteria.	1. Removal of drums. 2. Additional limited sampling/analysis of surface/near surface soils to confirm the prior results to satisfy AOC risk assessment/closure. 3. PCBs, TPH, SVOCs, and lead.
25	Underground Storage Tanks	Unknown buried structure present in 1943 aerial photos, but not present on any site plans. The proximity of this NED site to a 500,000 gallon water tank and cable terminal building, the linear feature between buried structure at this Site and the vicinity of NED Sites 34/38 suggests structure could be vault associated with subsurface utilities (vs. USTs).	Low brush and weeds at top of hill relative to surrounding area. No signs of USTs. No surficial evidence of USTs, contamination, or stressed vegetation. (Note: structure at NED Sites 34/38 appears to be manholes for utility vaults, consistent with theory based on aerial photos reviewed.)	Site location could not be found in the field. Broad geophysical (magnetometer) sweep of area did not locate any metallic anomalies that could be USTs. Location not sampled.	1. Subsurface assessment of underground structure via GPR or test pits to identify purpose and possibility of source area. 2. Sampling to occur only if structure identified to contain petroleum and/or hazardous materials. 3. TPH and VOCs. Possible other depending on identification of structure’s use.
26	Gas Pump House BLDG #23/Gas Tanks	Not present on 1919 and 1942 site plans. Labeled “Gas Tanks” and “Pump House” on 1943 site plan, and subsequent plans. Building present on January 1943 and subsequent aerial photos. Navy and RIDEM records suggest two 5,000-gallon gasoline USTs were removed in 1989. RIDEM reportedly observed tank removals and no remediation was deemed necessary at the time.	Collapsed wooden structure. Area clear of brush found where USTs may previously have been located. No other surficial evidence of contamination or stressed vegetation.	Water from USTs contained BTEX, lead and chlorinated/non-chlorinated solvents. Soil in location not sampled. No geophysical indication of UST or piping.	1. No further action. Previously removed USTs were removed by the Navy and, therefore, NED site is not covered under FUDS.
27	Two Gas Pits	Appears labeled as “Gasoline Pits” along eastern edge of concrete apron at south end of island on 1943 and 1945 site plans. Not present on 1919, 1942, 1957, or 1963 site plans. Slightly depressed areas shown on 1943 aerial photos, possibly representing refueling or drainage collection pits.	Evidence of site could not be found.	No visual evidence of site or stressed vegetation. Location not sampled.	1. Generalized assessment in vicinity to confirm lack of contaminated soil and groundwater. 2. Combine with NED Site 44 for risk assessment. 3. VOCs, SVOCs, TPH, metals, and PCBs.
28	Former Ordnance Test Facility/Hangar	First appears on 1943 site plan, labeled “Hangar.” Same label on 1945 and 1957 site plans. Labeled “Ordnance R&D Test Facility” on 1963 site plan. Not shown on 1919 and 1942 site plans. Present in January 1943 aerial photo.	No standing structures remain after 1985 hurricane. Concrete mat (floor/apron) covering large area found, including NED Sites 28, 31, 32, 42, and 43.	Could only find concrete apron. Building contents washed to sea during hurricane (1985). Location not sampled.	1. General assessment beneath concrete apron to confirm lack of contaminated soil. 2. Combine investigation with NED Sites 33 and 43 for AOC risk assessment/closure. 3. VOCs, SVOCs, explosives, PCBs, TPH, and metals.

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29	Former Unknown BLDG #1 (Hangar 5496-61)	Present in 1942 site plan, and in January and April 1943 aerial photos. No longer present in August 1943 aerial photo. Not shown on 1919, 1943, 1945, 1957, and 1963 site plans.	No standing structures remain after 1985 hurricane. Site could not be located precisely. Underground concrete vault found, open at the top, near the site.	Could only find concrete apron. Building contents washed to sea during hurricane (1985). Location not sampled.	1. No further action. 2. Upgradient sites 28, 33, and 43 are being sampled as and will satisfy risk assessment of general area, including NED Site 29.
30	Former Pyrotechnic Storage	Shown only on 1945 site plan. Not evident at site plan location on 1943 aerial photos.	Evidence of site could not be found.	No visual evidence of site or stressed vegetation. Building contents washed to sea during hurricane (1985). Location not sampled.	1. General assessment beneath concrete apron. 2. VOCs, SVOCs, explosives, PCBs, TPH, and metals.
31	Gas Pit	Appears labeled as “Gasoline Pits” along western edge of concrete apron at south end of island on 1943 site plan, and on the 1945 site plan. Not present on 1919, 1942, 1957, or 1963 site plans. Slightly depressed areas shown on 1943 aerial photos. May represent refueling or drainage collection pits.	No standing structures. Concrete mat (floor/apron) covering large area including NED Sites 28, 31, 32, 42, and 43.	Could only find concrete apron. Feature could not be found in the field. Location not sampled.	1. Generalized assessment in vicinity to confirm lack of contaminated soil and groundwater. 2. Combine investigation with NED Site 32 for AOC risk assessment/closure. 3. VOCs, SVOCs, TPH, metals, and PCBs
32	Former Drum Storage Area	Drums apparent on northwest corner of concrete apron at southern end of island in January and April 1943 aerial photos. Not discernable on other aerial photos. Not indicated on any of the site plans.	No standing structures. Concrete mat (floor/apron) covering large area including NED Sites 28, 31, 32, 42, and 43.	Could only find concrete apron. Site could not be found in the field. Location not sampled.	1. Generalized assessment in vicinity to confirm lack of contaminated soil and groundwater. 2. Combine investigation with NED Site 31 for AOC risk assessment/closure. 2. VOCs, SVOCs, TPH, metals, and PCBs.
33	Former Paint and Oil Storage #47	First appears on 1945 site plan, and is also shown on 1957 and 1963 site plans. Evident on 1943 aerial photos, but not on August 1942 aerial photo.	Evidence of site could not be found.	No visual evidence of site or stressed vegetation. Location not sampled.	1. Generalized assessment in vicinity to confirm lack of contaminated soil and groundwater. 2. Combine investigation with NED Sites 28 and 43 for AOC risk assessment/closure. 3. VOCs, SVOCs, TPH, metals, and PCBs.
34	Theater/Research BLDG #27	Not shown on the 1919 site plan. Present in 1942 and 1943 aerial photos. Shown on 1942, 1943, and 1945 site plans as “Research Building.” Labeled as “Theatre” on 1957 and 1953 site plans.	No building present. Foundation and elevated concrete structure (not typical of a transformer pad) still standing. No surficial evidence of contamination, USTs, or stressed vegetation.	No visual evidence of surficial contamination or stressed vegetation. Location not sampled.	No further action.
35	Boiler House #29	Not shown on 1919 or 1942 site plans. Shown on 1943 site plan, and all subsequent site plans. Not evident on August 1942 aerial photo, but is present on 1943 aerial photos.	Structure still standing. Three boilers present; fireboxes contain shaker grates, indicating coal-fired. No evidence of USTs. No surficial evidence of contamination, other than coal pieces and coal dust on ground surface. Vegetative cover in areas with coal less dense than surroundings.	Coal and coal ash were present. Location not sampled.	1. Horizontal and vertical extent of coal ash. 2. PAHs, metals, and dioxins.
36	Degaussing BLDG #26	Building shown on 1942 and all subsequent site plans, but not on 1919 site plan. Shown on 1942 and 1943 aerial photos. According to CENAE, the degaussing facility (demagnetizing of ships to prevent them from attracting mines or torpedoes) was put into operation in 1944.	Wooden structure still standing. Pipe exiting ground (UST fill pipe?). No other surficial evidence of contamination or stressed vegetation.	Geophysical survey did not identify any metallic anomalies resembling a UST including the vicinity of a pipe protruding from the ground. No visual evidence of surficial contamination or stressed vegetation. Location not sampled.	No further action.

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37	Misc. Storage #28	Building not present on 1919 site plan. Building is shown (but unlabeled) on 1942 site plan. Present on 1942 and 1943 aerial photos. Labeled “South Compressor Building” on 1943 and 1945 site plans, and “Misc. Storage” on 1957 and 1963 site plans. Evidence of UST found in the field also evident in the April 1943 aerial photo.	Concrete and brick structure still standing. Apparent UST found west of structure, between Bldgs. #28 and #10 (NED Sites 37 and 38). About 5 feet to top of liquid in UST. UST bottom about 8 feet deep. Sparse vegetative cover, but no surficial evidence of contamination.	One water sample was analyzed for TPH and VOC. No NAPLs present inside UST. Laboratory analysis of UST water sample revealed no detectable concentrations of VOCs or TPH. Soil in location not sampled.	1. UST removal and confirmatory assessment of soil and groundwater. 2. TPH, VOCs, SVOCs, PCBs, and metals.
38	Torpedo Storage #10	Building present on 1919 site plan and all subsequent site plans. Also shown on 1942 and 1943 aerial photos. Shed attached to northeast corner of building.	Large, elongated concrete and brick structure still standing. Mostly empty, but contains some electrical and water purifying equipment, some still in shipping crates. Weeping transformer found in alcove at northeast corner of bldg; oil residue present on building floor and/or ground surface near transformer. No other surficial evidence of contamination, USTs, or stressed vegetation.	No samples collected in vicinity of leaking transformers	1. Removal of transformer and contents from island. 2. Assess below transformers and general area. 3. TPH and PCBs.
39	Well House #81	Building first appears on 1943 site plan, labeled “Drilled Well.” Present in all subsequent site plans, labeled “Drilled Well” or “Deep Well Hose.” Not discernable on 1942 and 1943 aerial photos.	Brick structure still standing, containing pumping equipment. Evidence of removed electrical equipment, perhaps transformer. No surficial evidence of contamination, USTs, or stressed vegetation.	One composite soil sample collected in location of former transformer pad was analyzed for TPH and PCB. PCBs and TPH were detected in vicinity of former transformer pad. TPH and PCBs were below RIDEM soil screening levels, but PCBs exceed EPA RSL.	1. Nature and extent of previously identified PCBs in soil surrounding transformer pad. Observe pad location relative to well. 2. PCBs.
40	Well House #78	Building first evident on 1942 site plan, labeled “Drilled Well.” Present in all subsequent site plans, labeled “Drilled Well” or “Deep Well House.” Present in 1943 aerial photos.	Small wooden structure, still standing. No surficial evidence of contamination, USTs, or stressed vegetation.	No evidence of transformer/pad, UST, surficial soil contamination, or stressed vegetation. Location not sampled	No further action.
41	AA Guns Electrical Supply	First shown on 1942 plan. Pole-mounted transformers shown on plan. Portions of gun mount stations shown on all subsequent plans. Gun mount stations shown under construction in January 1943 aerial photo, and present in April and August 1943 aerial photos. Not present in August 1942 aerial photo. Transformer pole not discernable on aerial photos.	Transformer pole still standing, but transformers not present. No surficial evidence of contamination, USTs, or stressed vegetation.	One composite soil sample collected around base of pole where transformer was formerly located was analyzed for TPH and PCB. No evidence of transformer/pad, UST, (no metal anomalies representative of possible USTs during geophysical survey), surficial soil contamination, or stressed vegetation. PCBs not detected. TPH detected just below RIDEM soil standard.	1. Confirm that prior concentrations in soil do not exceed EPA RSL in vicinity of prior sample to satisfy AOC risk assessment/closure. 2. TPH.
42	5,000-Gallon Tank (Av gas) Ordnance Test Facility Gasoline Outlet #30	“5000 gal. Aviation Gas Tank” shown on 1942 site plan. Labeled “Gas Tanks” and “Gasoline Pump” on 1942 site plan. Not shown on other site plans. Not discernable on aerial photos.	No standing structures. Concrete mat (floor/apron) covering large area, including Sites 28, 31, 32, 42, and 43.	Concrete apron present. No visual evidence of site or stressed vegetation could be found. Location not sampled.	1. Generalized assessment in vicinity beneath apron to confirm lack of contaminated soil. 2. VOCs, SVOCs, TPH, metals, and PCBs.
43	Former Ordnance Test Facility Paint Shed #30	First present on 1942 site plan, labeled “Paint Storage.” Labeled “Paint Shed” on 1942 plan. Not present on 1943 and subsequent site plans. Evident on August 1942 aerial photo, but not present on January 1943 and subsequent 1943 aerial photos.	No standing structures. Concrete mat (floor/apron) covering large area, including Sites 28, 31, 32, 42, and 43.	Concrete apron present. No visual evidence of site or stressed vegetation could be found. Location not sampled.	1. Generalized assessment in vicinity to confirm lack of contaminated soil. 2. Combine investigation with NED Sites 28 and 33 for AOC risk assessment/closure. 2. VOCs, SVOCs, TPH, metals, PCBs, and explosives.

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44	Empty Drums at south end of concrete mat area near sites 27-33	No records pertaining to these. Not shown on aerial photos.	Two empty, rusted, 55-gallon drums found on ground surface. No other surficial evidence of contamination, USTs, or stressed vegetation found.	One composite soil sample was analyzed for TPH and PCB. Two empty 55-gallon drums found at south end of island off concrete apron. PCBs and TPH were detected in a soil sample at concentrations below current comparison criteria.	1. Removal of empty drums from the island. 2. Sampling/analysis of surface/near surface soils to confirm prior results after drum removal. No sampling to occur if drums are not currently identified based on prior results. 3. Combine investigation with NED Site 27 for AOC risk assessment/closure. 4. PCBs, TPH, SVOCs, and lead.
45	Fire Apparatus Houses (hose houses) (2 locations)	First present on 1942 site plan. Also present on 1943 site plan. Only southernmost building shown on 1945 and 1957 drawings, unlabeled. Not present on 1963 site plan. Not evident on August 1942 aerial photo, but present on 1943 aerial photos.	Evidence of site could not be found.	No visual evidence of site or stressed vegetation found. Location not sampled.	No further action.
46	AA Gun Emplacements/ Possible Underground Ordnance Bunkers (4 locations)	No records related to this. Potential site identified by RIDEM.	Evidence of site could not be found.	No visual evidence of site or stressed vegetation found. Location not sampled.	1.Perform GPR survey to further confirm no underground structures appear to be present associated with the gun emplacements that typically had underground ammunition and housing ¹ .
47	Underground Water Tank #31	Under construction on August 1942 aerial photo. First present on February 4, 1943, plan titled “Fresh & Salt Water Lines”. Labeled “500,000 Gals. Water Tank” with lines leading from water treatment plant building. Present on all subsequent site plans. Present on 1943 aerial photos.	Site (top of large underground concrete tank) mostly covered with shallow water at time of inspection. Pump house still standing. Pipe vent and manhole entrance to tank found. Tank empty except trace water on bottom, concrete bottom visible about 15 feet below top of manhole. No evidence of contamination found.	Little water present in tank, insufficient depth to sample. No visual/olfactory evidence of contamination. Location not sampled.	Navy Easement – Not FUDS eligible. No further action.

Notes:

PAHs – polycyclic aromatic hydrocarbons	TPH – total petroleum hydrocarbons	UST – underground storage tank	SVOC – semi-volatile organic compounds
COPC – contaminant of potential concern	PCB – polychlorinated biphenyl	TEL – threshold effect level	RIDEM – Rhode Island Department of Environmental Management
PEL – predicted effect level	VOC – volatile organic compound	EOD – Explosive Ordnance Division	BTEX – benzene, toluene, ethylbenzene, xylenes
NAPL – non-aqueous phase liquid	PFAS – per- polyfluorinated alkyl substances		

“Current comparison criteria” referenced herein is the U.S. EPA Regional Screening Levels (RSLs; Target Hazard Quotient [THQ] of 0.1) and the RIDEM Direct Exposure Soil criteria.

1919 Site Plan: Gould Island Conditions, June 30, 1919

1942 Site Plan: Topographic Survey, P.W. Drawing No. 5496-61

1943 Site Plan: Gould Island, U.S. Naval Torpedo Station, U.S. Naval Air Facility, Newport, RI Showing Conditions on June 30, 1943

1945 Site Plan: Gould Island, U.S. Naval Torpedo Station, U.S. Naval Air Facility, Newport, RI Showing Conditions on June 30, 1945

1957 Site Plan: Master Shore Station Development Plan, General Development Plan, Existing and Planned Peacetime Conditions as of December 31, 1957

1963 Site Plan: General Development Plan, Existing and Planned Pre-M-Day, Gould Island site plan dated October 4, 1963

¹ McBurney, Christian; Wallin Brian; Conley, Patrick; Kennedy John; Taylor, Maureen. *World War II Rhode Island*, Chapter 6- The Growth of Naval Activity and Its Effect on Aquidneck Island. Page 8 of chapter.

Table 2
Summary of Historical Sediment and Mussel Analytical Results
Gould Island Site
Narragansett Bay, Rhode Island

[illegible]

NOTES:
 mg/kg - milligrams per kilogram
 I - National Oceanic and Atmospheric Administration (NOAA) Surface Water Quality Laboratory
 ND - Results were below the laboratory reporting limits, reporting limit = 0.1 mg/kg
 NS - Not established
 NS - Not sampled
 bgs - below ground surface
 J - Results are considered estimated
 UJ - Results are below the laboratory LOD, LOD is estimated
 UJ - Not detected at the laboratory LOD, LOD indicated
 FS - field sample
 FD - field duplicate
 RE - re-analyzed result
 NA - Not applicable, current criteria available or criteria vary by season
Bold Exceeds laboratory LOD or is an estimated concentration (J)
Exceeds PEL or TEL
LOD exceeds comparison criteria

Table 2
Summary of Historical Sediment and Mussel Analytical Results
Gould Island Site
Narragansett Bay, Rhode Island

Location:		MP #4				MP #5				MP #6				MP #7				AHC #1				AHC #2				AHC #3				AHC #4				AHC #5				AHC #6			
Sample ID:		3325	3338			3326	3339			3327	3340			3328	3341			3396	3402	3403		3397	3404			3398	3405			3399	3406			3400	3407			3401	3408		
Sample Depth:		Sediment	Mussell			Sediment	Mussell			Sediment	Mussell			Sediment	Mussell			Sediment	Surface soil	Mussell		Sediment	Mussell			Sediment	Mussell			Sediment	Mussell			Sediment	Mussell			Sediment	Mussell		
Date Sampled:		1987	1987			1987	1987			1987	1987			1987	1987			1987	1987	1987		1987	1987			1987	1987			1987	1987			1987	1987			1987	1987		
Sample Type:		FS	FS			FS	FS			FS	FS			FS	FS			FS	FS	FS		FS	FS			FS	FS			FS	FS			FS	FS			FS	FS		
Parameter	TEL ¹	PEL ¹	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier			
Explosives by EPA Method 8330A (mg/kg)																																									
1,3,5-trinitrobenzene	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS				
1,3-dinitrobenzene	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS				
2,4,6-trinitrotoluene	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS				
2,4-dinitrotoluene	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS				
2,6-dinitrotoluene	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS				
2-amino-4,6-dinitrotoluene	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS				
4-amino-2,6-dinitrotoluene	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS				
2-nitrotoluene	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS				
3-nitrotoluene	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS				
4-nitrotoluene	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS				
hex	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS				
nitrobenzene	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS				
nitroglycerin	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS				
picric acid	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS				
phenol	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS				
pic	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS				
picryl	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS				
Polychlorinated biphenyls (PCBs) (mg/kg)																																									
PCBs	21.6	189	1.58		0.30		0.07		0.03		0.06		0.05		0.01		0.04		0.02		0.03		0.04		0.03		0.04		1.02		0.02		5.26		0.02		1.16				
PCBs																																									
Metals (mg/kg)																																									
chromium	52.3	160	0.48		2.0		2,190.0		2.0	U	06.0		2.0	U	11.0		2.0	U	10.0		4.9		2.0	U	10.0		2.0	U	27.0		2.0	U	58.0		2.0	U	101.0				
E.P. Tox - chromium (mg/L)	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS						
cadmium	0.08	4.21	12.0		0.4	U	7.0		0.4	U	8.0		0.4	U	2.0		0.4	U	2.0		0.4	U	0.4	U	0.4	U	3.0		0.4	U	5.0		0.4	U	6.0						
lead	30.24	112	2,290.0		3.0	U	587.0		3.0	U	3,680.0		3.0	U	16.0		3.0	U	15.0		3.0	U	3.0	U	20.0		3.0	U	249.0		3.0	U	452.0		3.0	U	502.0				
E.P. Tox - lead (mg/L)	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS						
arsenic	7.24	41.8	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS						
mercury	0.12	0.70	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS						
selenium	0.02	0.10	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS						
silver	0.75	1.77	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS						
copper	18.7	108	1,220.0		1.5		2,210.0		1.4	U	3,901.0		1.4	U	16.0		1.4	U	14.0		6.3		4.3		19.0		5.4		233.0		4.9		431.0		3.5						
E.P. Tox - copper (mg/L)	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS						
berium	130.1	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS						
nickel	75.0	62.8	154.0		7.0	U	1,410.0		7.0	U	400.0		6.0	U	33.0		7.0	U	30.0		7.0	U	6.0	U	30.0		6.0	U	42.0		7.0	U	106.0		6.0	U					
E.P. Tox - nickel (mg/L)	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS						
beryllium	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS						
antimony	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS						
tin	0.048	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS						
pyrrolide	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS						
zinc	124	271	1,790.0		18.0		587.0		18.0		1,760.0		14.0		67.0		15.0		39.0		21.0		19.0		46.0		16.0		916.0		17.0		1,290.0		19.0						
Total Petroleum Hydrocarbons (TPH) by EPA Method 8015M																																									
TPH	NE	NE	330.0		170.0		170.0		1,100.0		1,100.0		30.0		30.0		30.0		50.0		120.0		290.0		120.0		1,800.0		290.0		2,100.0		1,800.0		150.0						
TPH																																									

NOTES:
mg/kg - milligrams per kilogram
1 - National Oceanic and Atmospheric Administration (NOAA) Sc
ND - Results were below the laboratory reporting limits, reporting
NE - Not established
NS - Not sampled
bgs - below ground surface
J - Results are considered estimated
UJ - Results are below the laboratory LOD, LOD is estimated
UJ - Not detected at the laboratory LOD, LOD indicated
FS - field sample
FD - field duplicate
RE - reanalyzed result
NA - Not applicable, current criteria available or criteria vary by c
Bold Exceeds laboratory LOD or is

Table 3
Summary of Historical Soil Analytical Results
Gould Island Site
Narragansett Bay, Rhode Island

RED Site No.:					MRS-1										1		10					13				19				
Sample ID:					GI-DA-SB-04-01				GI-DA-SS-02-01				GI-DA-SS-02-02		GI-DA-SS-02-03		01SS-001		10SS-001			10SS-002		13SS-001		13SS-002		19SS-001		
Sample Depth:					4 feet bgs				16-20 inches bgs				16-20 inches bgs		16-20 inches bgs															
Sample Date					12/9/2008				12/9/2008				12/9/2008		12/9/2008		12/14/1994		12/14/1994			12/21/1994		12/15/1994		12/15/1994		12/14/1994		
Field QC:					FS		FD		FS		FD		FS		FS		FS		FS		FD		FS		FS		FS		FS	
Parameter*	RIDEM ¹ Direct Exposure Residential	RIDEM ¹ Direct Exposure Comm/Indus.	RSL ² Residential THQ: 0.1	RSL ² Industrial THQ: 0.1	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
Explosives by EPA Method 8330A (mg/kg)																														
1,3,5-trinitrobenzene	NE	NE	220	3,200	0.4	U	0.4	U	0.080	U	0.4	U	0.4	U	0.4	U	NS		NS		NS		NS		NS		NS		NS	
1,3-dinitrobenzene	NE	NE	0.63	8	0.4	U	0.4	U	0.08	U	0.4	U	0.4	U	0.4	U	NS		NS		NS		NS		NS		NS		NS	
2,4,6-trinitrotoluene (TNT)	NE	NE	3.6	51	0.4	U	0.4	U	0.08	U	0.4	U	0.4	U	0.4	U	NS		NS		NS		NS		NS		NS		NS	
2,4-dinitrotoluene	NE	NE	1.7	7.4	0.4	U	0.4	U	0.08	U	0.4	U	0.4	U	0.4	U	NS		NS		NS		NS		NS		NS		NS	
2,6-dinitrotoluene	NE	NE	0.36	1.5	0.4	UJ	0.4	UJ	0.08	UJ	0.4	UJ	0.4	UJ	0.4	UJ	NS		NS		NS		NS		NS		NS		NS	
2-amino-4,6-dinitrotoluene	NE	NE	15	230	0.4	U	0.4	U	0.08	U	0.4	U	0.4	U	0.4	U	NS		NS		NS		NS		NS		NS		NS	
4-amino-2,6-dinitrotoluene	NE	NE	15	230	0.4	U	0.4	U	0.08	U	0.4	U	0.4	U	0.4	U	NS		NS		NS		NS		NS		NS		NS	
2-nitrotoluene	NE	NE	3.2	15	0.8	U	0.8	U	0.16	U	0.8	U	0.8	U	0.8	U	NS		NS		NS		NS		NS		NS		NS	
3-nitrotoluene	NE	NE	0.63	8.2	0.8	U	0.8	U	0.16	U	0.8	U	0.8	U	0.8	U	NS		NS		NS		NS		NS		NS		NS	
4-nitrotoluene	NE	NE	25	140	0.8	U	0.8	U	0.16	U	0.8	U	0.8	U	0.8	U	NS		NS		NS		NS		NS		NS		NS	
hmx	NE	NE	390	5,700	0.8	U	0.8	U	0.16	U	0.8	U	0.8	U	0.8	U	NS		NS		NS		NS		NS		NS		NS	
nitrobenzene	NE	NE	5	22	0.4	U	0.4	U	0.08	U	0.4	U	0.4	U	0.4	U	NS		NS		NS		NS		NS		NS		NS	
nitroglycerin	NE	NE	1	8	40	U	40	U	8	U	40	U	1200	U	40	U	NS		NS		NS		NS		NS		NS		NS	
pentaerythritol tetranitrate (PETN)	NE	NE	13	160	2	U	2	U	0.4	U	2	U	2	U	2	U	NS		NS		NS		NS		NS		NS		NS	
hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	NE	NE	0.1	28	0.8	U	0.8	U	0.16	U	0.8	U	0.8	U	0.8	U	NS		NS		NS		NS		NS		NS		NS	
trinitrophenylmethylnitramine (tetryl)	NE	NE	16	230	0.8	U	0.8	U	0.16	U	0.8	U	0.8	U	0.8	U	NS		NS		NS		NS		NS		NS		NS	
Total Petroleum Hydrocarbons (TPH) by EPA Method 8015M (mg/kg)																														
TPH	500	2,500	Variable	Variable	NS		NS		NS		NS		NS		NS		320		36	J	33	J	370		2,900		220		26	
Polychlorinated biphenyls (PCBs) by EPA Method 8080 (mg/kg)																														
PCB-1254	10	10	0.12	0.97	NS		NS		NS		NS		NS		NS		NS		0.019	U	0.019	U	0.02	U	0.13	U	0.15	U	NS	
PCB-1260	10	10	0.24	0.99	NS		NS		NS		NS		NS		NS		NS		0.019	U	0.019	U	0.02	U	0.019	J	0.39		NS	
Total PCBs	10	10	NE	NE	NS		NS		NS		NS		NS		NS		NS		0.019	U	0.019	U	0.02	U	0.019		0.39		NS	
Pesticides by EPA Method 8080 (mg/kg)																														
4,4-DDT	NA	NA	1.9	8.5	NS		NS		NS		NS		NS		NS		NS		0.0036	U	0.0036	U	0.0053		NS		NS		NS	
Endrin aldehyde	NE	NE	NE	NE	NS		NS		NS		NS		NS		NS		NS		0.0036	U	0.0036	U	0.004	U	NS		NS		NS	
Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270 (mg/kg)																														
naphthalene	54	10,000	3.8	17	NS		NS		NS		NS		NS		NS		0.061	J	0.36	U	0.36	U	1.1		NS		NS		NS	
2-methylnaphthalene	123	1,000	24	300	NS		NS		NS		NS		NS		NS		0.072	J	0.36	U	0.36	U	0.53		NS		NS		NS	
acenaphthylene	23	10,000	NE	NE	NS		NS		NS		NS		NS		NS		0.049	J	0.36	U	0.36	U	0.4	U	NS		NS		NS	
acenaphthene	33	10,000	360	4500	NS		NS		NS		NS		NS		NS		0.4	U	0.36	U	0.36	U	3.3		NS		NS		NS	
dibenzofuran	NE	NE	7.3	100	NS		NS		NS		NS		NS		NS		0.049	J	0.36	U	0.36	U	1.8		NS		NS		NS	
fluorene	28	10,000	240	3000	NS		NS		NS		NS		NS		NS		0.039	J	0.36	U	0.36	U	2.9		NS		NS		NS	
phenanthrene	40	10,000	NE	NE	NS		NS		NS		NS		NS		NS		0.63		0.36	U	0.041	J	24		NS		NS		NS	
anthracene	35	10,000	1800	23000	NS		NS		NS		NS		NS		NS		0.061	J	0.36	U	0.36	U	7.1		NS		NS		NS	
carbazole	NE	NE	NE	NE	NS		NS		NS		NS		NS		NS		0.4	U	0.36	U	0.36	U	2.6		NS		NS		NS	
fluoranthene	20	10,000	240	3000	NS		NS		NS		NS		NS		NS		0.95		0.15	J	0.075	J	30		NS		NS		NS	
pyrene	13	10,000	180	2300	NS		NS		NS		NS		NS		NS		0.8		0.36	U	0.061	J	20		NS		NS		NS	
benzo(a)anthracene	0.9	7.8	1.1	21	NS		NS		NS		NS		NS		NS		0.49		0.36	U	0.36	U	12		NS		NS		NS	
chrysene	0.4	780	110	2100	NS		NS		NS		NS		NS		NS		0.71		0.36	U	0.36	U	11		NS		NS		NS	
benzo(b)fluoranthene	0.9	7.8	1.1	21	NS		NS		NS		NS		NS		NS		0.7		0.08	J	0.047	J	13		NS		NS		NS	
benzo(k)fluoranthene	0.9	78	11	210	NS		NS		NS		NS		NS		NS		0.2	J	0.36	U	0.017	J	4.4		NS		NS		NS	
benzo(a)pyrene	0.4	0.8	0.11	2.1	NS		NS		NS		NS		NS		NS		0.44		0.059	J	0.031	J	11		NS		NS		NS	
indeno(1,2,3-cd)pyrene	0.9	7.8	1.1	21	NS		NS		NS		NS		NS		NS		0.31	J	0.046	J	0.023	J	6.8		NS		NS		NS	
dibenz(a,h)anthracene	0.4	0.8	0.11	2.1	NS		NS		NS		NS		NS		NS		0.12	J	0.36	U	0.36	U	1.7		NS		NS		NS	
benzo(g,h,i)perylene	0.8	10,000	NE	NE	NS		NS		NS		NS		NS		NS		0.3	J	0.36	U	0.36	U	5.7		NS		NS		NS	
RCRA Metals by EPA Methods 6010, 7060, 7131, 7471, and 7740 (mg/kg)																														
arsenic	7	7	0.68	3	NS		NS		NS		NS		NS		NS		10		1	U	1		2		5		2		NS	
barium	5,500	10,000	1,500	22,000	NS		NS		NS		NS		NS		NS		36	J	20	J	26	J	30		40	J	20	J	NS	
cadmium	39	1,000	7.1	98	NS		NS		NS		NS		NS		NS		0.06		0.28		0.33		3.5		1.6		2.0		NS	
chromium*	390	10,000	0.3	6.3	NS		NS		NS		NS		NS		NS		52	J	7	J	180	J	11		4	J	5	J	NS	
lead	150	500	400	800	NS		NS		NS		NS		NS		NS		17	J	21	J	340	J	150		65	J	370	J	NS	
mercury	23	610	1	5	NS		NS		NS		NS		NS		NS		0.0005		0.00009	U	0.00007	U	0.0001		0.0002		0.0001		NS	
selenium	390	10,000	39	580	NS		NS		NS		NS		NS		NS		4	U	1	U	1	U	1		2	U	1	U	NS	
silver	200	10,000	39	580	NS		NS		NS		NS		NS		NS		2	U	2	U	2	U	2		3	U	2	U	NS	
Nitrate by EPA Method 300.0M (mg/kg)																														
nitrate	NE	NE	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		3.9		NS		NS		NS	

Table 3
Summary of Historical Soil Analytical Results
Gould Island Site
Narragansett Bay, Rhode Island

NED Site No.:					21				22				23		24				39		41		44		48A		48B			
Sample ID:					21SS-001		21SS-002		22SS-001		22SS-002		23SS-001		24SS-001				39SS-001		41SS-001		44SS-001		48SS-001		48SS-002			
Sample Depth:																														
Sample Date					12/15/1994		12/15/1994		12/15/1994		12/15/1994		12/15/1994		12/15/1994				12/14/1994		12/15/1994		12/21/1994		12/21/1994		12/21/1994			
Field QC:					FS		FD		FS		FS		FS		FS				FS		FS		FS		BG		BG			
Parameter*	RIDEM ¹ Direct Exposure Residential	RIDEM ¹ Direct Exposure Comm/Indus.	RSL ² Residential THQ: 0.1	RSL ² Industrial THQ: 0.1	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier		
Explosives by EPA Method 8330A (mg/kg)																														
1,3,5-trinitrobenzene	NE	NE	220	3,200	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS			
1,3-dinitrobenzene	NE	NE	0.63	8	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS			
2,4,6-trinitrotoluene (TNT)	NE	NE	3.6	51	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS			
2,4-dinitrotoluene	NE	NE	1.7	7.4	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS			
2,6-dinitrotoluene	NE	NE	0.36	1.5	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS			
2-amino-4,6-dinitrotoluene	NE	NE	15	230	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS			
4-amino-2,6-dinitrotoluene	NE	NE	15	230	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS			
2-nitrotoluene	NE	NE	3.2	15	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS			
3-nitrotoluene	NE	NE	0.63	8.2	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS			
4-nitrotoluene	NE	NE	25	140	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS			
hmz	NE	NE	390	5,700	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS			
nitrobenzene	NE	NE	5	22	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS			
nitroglycerin	NE	NE	1	8	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS			
pentaerythritol tetranitrate (PETN)	NE	NE	13	160	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS			
hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	NE	NE	6.1	28	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS			
trinitrophenylmethylnitramine (tetra)	NE	NE	16	230	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS			
Total Petroleum Hydrocarbons (TPH) by EPA Method 8015M (mg/kg)																														
TPH	500	2,500	Variable	Variable	2,400	J	3,200	J	78		270		49		430		320		NS		210		430		93		110		17	
Polychlorinated biphenyls (PCBs) by EPA Method 8080 (mg/kg)																														
PCB-1254	10	10	0.12	0.97	NS		NS		NS		NS		NS		0.12	U	0.12	U	0.17	U	0.1	U	0.028		0.022	U	0.019	U		
PCB-1260	10	10	0.24	0.99	NS		NS		NS		NS		NS		0.028	J	0.033	J	1.4	J	0.1	U	0.02	U	0.022	U	0.019	U		
Total PCBs	10	10	NE	NE	NS		NS		NS		NS		NS		0.028		0.033		1.4		0.1	U	0.028		0.022	U	0.019	U		
Pesticides by EPA Method 8080 (mg/kg)																														
4,4-DDT	NA	NA	1.9	8.5	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0064		0.0036	U		
Endrin aldehyde	NA	NA	NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0043	U	0.0054			
Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270 (mg/kg)																														
naphthalene	54	10,000	3.8	17	NS		NS		NS		NS		0.021	J	NS		NS		NS		NS		NS		0.07	J	0.015	J		
2-methylnaphthalene	123	1,000	24	300	NS		NS		NS		NS		0.052	J	NS		NS		NS		NS		NS		0.43	U	0.36	U		
acenaphthylene	23	10,000	NE	NE	NS		NS		NS		NS		0.4	U	NS		NS		NS		NS		NS		0.43	J	0.36	U		
acenaphthene	43	10,000	360	4500	NS		NS		NS		NS		0.4	U	NS		NS		NS		NS		NS		0.14	J	0.066	J		
dibenzofuran	NE	NE	7.3	100	NS		NS		NS		NS		0.4	U	NS		NS		NS		NS		NS		0.063	J	0.03	J		
fluorene	10	10,000	240	3000	NS		NS		NS		NS		0.03	J	NS		NS		NS		NS		NS		0.089	J	0.055	J		
phenanthrene	40	10,000	NE	NE	NS		NS		NS		NS		0.41	J	NS		NS		NS		NS		NS		1.0	J	0.58	J		
anthracene	35	10,000	1800	23000	NS		NS		NS		NS		0.4	U	NS		NS		NS		NS		NS		0.16	J	0.1	J		
carbazole	NE	NE	NE	NE	NS		NS		NS		NS		0.4	U	NS		NS		NS		NS		NS		0.17	J	0.071	J		
fluoranthene	20	10,000	240	3000	NS		NS		NS		NS		0.12	J	NS		NS		NS		NS		NS		2.7		0.7			
pyrene	13	10,000	180	2300	NS		NS		NS		NS		0.14	J	NS		NS		NS		NS		NS		2.0		0.66			
benzo(a)anthracene	0.9	7.8	1.1	21	NS		NS		NS		NS		0.091	J	NS		NS		NS		NS		NS		1.4		0.3	J		
chrysene	0.4	780	110	2100	NS		NS		NS		NS		0.48	J	NS		NS		NS		NS		NS		1.7		0.31	J		
benzo(b)fluoranthene	0.9	7.8	1.1	21	NS		NS		NS		NS		0.22	J	NS		NS		NS		NS		NS		1.8		0.36	J		
benzo(k)fluoranthene	0.9	7.8	1.1	210	NS		NS		NS		NS		0.021	J	NS		NS		NS		NS		NS		0.66		0.13	J		
benzo(a)pyrene	0.4	0.8	0.11	2.1	NS		NS		NS		NS		0.18	J	NS		NS		NS		NS		NS		1.3		0.27	J		
indeno(1,2,3-cd)pyrene	0.9	7.8	1.1	21	NS		NS		NS		NS		0.047	J	NS		NS		NS		NS		NS		0.9		0.18	J		
dibenzo(a,h)anthracene	0.4	0.8	0.11	2.1	NS		NS		NS		NS		0.044	J	NS		NS		NS		NS		NS		0.22	J	0.048	J		
benzo(g,h,i)perylene	0.8	10,000	NE	NE	NS		NS		NS		NS		0.086	J	NS		NS		NS		NS		NS		0.77		0.17	J		
RCRA Metals by EPA Methods 6010, 7060, 7131, 7471, and 7740 (mg/kg)																														
arsenic	7	7	0.68	3	40		NS		19		7		10		10		NS		NS		NS		NS		4		1.2			
barium	5,500	10,000	1,500	22,000	50	J	NS		80	J	63	J	60	UJ	32	J	NS		NS		NS		NS		20		20			
cadmium	39	1,000	7.1	98	0.3		NS		0.9		0.18		2.8		0.09		NS		NS		NS		NS		0.1		0.07			
chromium	390	10,000	0.3	6.3	13	J	NS		24	J	7.6	J	120	J	3.0	J	NS		NS		NS		NS		9		13			
lead	150	500	400	800	620	J	NS		200	J	22	J	950	J	9	J	NS		NS		NS		NS		36		170			
mercury	23	610	1	5	0.0001	J	NS		0.0001	U	0.00008	U	0.00035	J	0.0002	J	NS		NS		NS		NS		0.0001	U	0.00008	U		
selenium	390	10,000	39	580	1	UJ	NS		1	UJ	0.9	UJ	1	UJ	2	J	NS		NS		NS		NS		1	U	0.8	U		
silver	200	10,000	39	580	3	UJ	NS		2	UJ	2	UJ	10	UJ	2	UJ	NS		NS		NS		NS		2.0	U	2	U		
Nitrate by EPA Method 300.0M (mg/kg)																														
nitrate	NE	NE	NE	NE	15		15		8.2		1.6		21.3		NS		NS		NS		NS		NS		NS		NS		NS	