Work Plan

for

Non-Time-Critical Removal Action

Old Fire Fighting Training Area
NAVSTA, Newport, Rhode Island

Naval Facilities Engineering Command
Mid-Atlantic

Contract Number N62472-03-D-0057
Contract Task Order 65

September 2007

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND, MID-ATLANTIC
9742 MARYLAND AVENUE
NORFOLK, VA 23511-3095

IN REPLY REFER TO:

5090
Code OPNEEV4/JLC
September 14, 2007

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USEPA Region I
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Suite 1100 (HBT)
Boston MA 02114-2023

Mr. Paul Kulpa, Project Manager
Office of Waste Management
Rhode Island Department of Environmental Management
235 Promenade Street
Providence, RI 02908-5767

Dear Ms. Keckler & Mr. Kulpa

Subject: Final Removal Action Work Plan, Soil Removal Actions, and Response to Comments, Draft Final Removal Action Work Plan, Old Fire Fighting Training Area, Naval Station, Newport Rhode Island

The Navy is forwarding 4 copies (2 paper and 2 CDs) of the Final Removal Action Work Plan for Soil Removal Actions at the Old Fire Fighting Training Area (OFFTA) at Naval Station Newport, in Newport, Rhode Island. The Final Work Plan incorporates comments and Navy responses, as appropriate, to the Draft Final version of the Work Plan submitted on May 1, 2007.

Also enclosed, you will find responses to your comments regarding the Draft Final Work Plan dated 6/25/07 and 6/29/07, respectively.

Section 12 of the FFA for Naval Station, Newport provides that once the need for a removal action has been determined, various documentation including a work plan, for the proposed action, will be submitted to EPA and the State for review. Section 12.5(f) further states that after the Navy responds to regulatory comments on the work plan, the EPA and State must then declare whether they disagree or concur with the proposed removal action. Statements provided by both the EPA and RIDEM in their letters of 6/25/07 and 6/29/07, respectively, both indicate concurrence with the need for this removal action.

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As far as the Navy can tell, most of the concerns expressed by RIDEM are over the completeness of the removal action as it pertains to the final remedy for the site. Please note that at this time, the Navy is not considering this as the final remedy for the OFFTA site. That determination will be made as part of the discussions regarding the upcoming Feasibility Study.

As such, the Navy will not respond to any further comments that may be issued regarding this work plan and will begin efforts to mobilize into the field for the purpose of implementing the work plan. A project schedule will be provided to you shortly.

If you need to discuss this issue further, you can contact me by phone at (757) 444-4217 or by email at james.colter@navy.mil.

Sincerely,

JAMES L. COLTER, P.E.
Remedial Project Manager
By direction of the
Commanding Officer

Enclosures

Copy to: (w/encls.)
NOAA, Ken Finkelstein (1 paper, 1 CD)
Gannett Fleming, Paula Loht (1 paper, 1 CD)
NAVSTA Newport, Cornelia Mueller (1 paper, 1 CD)
NAVSTA Newport FEAD, Bob Krivinskas (1 paper, 1 CD)
NAVSTA Newport RAB, c/o Cornelia Mueller (4 CD)
NAVFAC Atlantic, Dave Barclift
TtNUS, Steve Parker
Admin Record/Information Repository

W5207412F

WORK PLAN

FOR

NON-TIME-CRITICAL REMOVAL ACTION

OLD FIRE FIGHTING TRAINING AREA
NAVSTA, NEWPORT RHODE ISLAND

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Naval Facilities Engineering Command Mid-Atlantic
9742 Maryland Avenue
Norfolk, Virginia 23511-3095

Submitted by:
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CONTRACT NUMBER N62472-03-D-0057
CONTRACT TASK ORDER 65

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APPENDICES

1.0 INTRODUCTION

Tetra Tech NUS (TtNUS) has prepared this removal action (RA) work plan to describe the Non-Time-Critical Removal Action (NTCRA) and related activities that will be performed to (a) remove and dispose of subsurface structures and contaminated soil and (b) construct an engineered replacement stone revetment to replace the existing shoreline protection system at the Old Fire-Fighting Training Area (OFFTA) at the Naval Station (NAVSTA) Newport located in Newport, Rhode Island.

The removal action described in this work plan only targets certain removal areas and provides exploratory measures to determine other sources of contamination on-site. The Navy is not seeking or expecting a determination of No Further Action based on the outcomes of this work.

The work described in this plan includes mobilization, site and staging area preparation, soil and structure excavation and removal, revetment construction, protection of shoreline resources, prevention of contaminant migration, confirmation sampling, waste characterization, equipment decontamination, on-site soil reuse, off-site transportation and disposal, site restoration, and demobilization.

A design document for the replacement stone revetment will be developed and provided as a separate deliverable for review as a 30%, (similar to a Draft document) and 90% (similar to a draft final).

This removal action is being conducted in accordance with the Action Memorandum (Draft) prepared under the Installation Restoration Program and Federal Facilities Agreement. The Action Memorandum is attached as Appendix A.

1.1 PROJECT BACKGROUND

NAVSTA Newport is located approximately 60 miles southwest of Boston, Massachusetts, and 25 miles south of Providence, Rhode Island. It occupies approximately 1,063 acres, with portions of the facility located in the City of Newport and Towns of Middletown and Portsmouth, Rhode Island. The facility layout is long and narrow, following the western shoreline of Aquidneck Island for approximately 6 miles facing the east passage of Narragansett Bay. The OFFTA site is located at the northern end of Coasters Harbor Island in Newport (see Site Map, Figure 1-1) and occupies approximately 5.5 acres. It is bordered by Taylor Drive to the south and surrounded by Coasters Harbor (part of Narragansett Bay) to the east, north, and west. The site is generally flat, with base grade surface elevations ranging from 8 to 12 feet above mean low water (MLW). The site is primarily overgrown with grass and few trees. A one-story concrete block building (Building 144), used for recruiting offices, is located along the central southern edge of the site. Access is restricted by a chain link fence along the southern side. Additional remnant

fencing from a former ballfield and former recreational equipment storage area is located in the central portion of the site.

The OFFTA site was home to a Navy fire-fighting training facility from World War II until 1972. During the training operations, fuel oils were ignited and extinguished in various structures at the site including burn pits, so-called Christmas tree above-ground spray nozzle arrays, and small "Carrier Compartment" buildings that simulated shipboard compartments. A water/oil mixture used to ignite each structure was reportedly transported between the buildings via underground piping. It is presumed that water and residual fuels were drained from the structures, passed through an oil-water separator, and discharged to Coasters Harbor. Historic photos and maps provided in the FS report (TtNUS September 2002) show subsurface drainage pipes discharging from these structures directly north into Coasters Harbor (refer also to historic drawings provided in Appendix B). Upon closure of the OFFTA site in 1972, the training structures were demolished and some concrete slabs and rubble were buried into three large mounds (heights ranging from 4 to 20 feet) on the site. In September 2004 through March 2005, the Navy conducted a NTCRA to remove the mounds. Additionally, the site was used for recreational purposes until its closure in October 1998, and most recently the central portion of the site formerly functioned as a gravel parking area.

Extensive investigations have been conducted at the site including Remedial Investigations, Feasibility Studies, and Pre-Design Investigations. Investigation results indicate that past site activities caused the release of both organic and inorganic contaminants. The primary contaminants considered site-related are total petroleum hydrocarbons (TPH), lead, and polycyclic aromatic hydrocarbons (PAHs), which are presumed to be a result of the petroleum products. Other contaminants found that are not considered site-related include the metals antimony, arsenic, beryllium and manganese, and the pesticide dieldrin. The highest on-site concentrations of TPH in soil were found to exceed 30,000 mg/kg, which is the upper concentration limit (UCL) as specified by the Rhode Island Department of Environmental Management (RIDEM) Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases **(**Remediation Regulations) (RIDEM, August 2004).

1.2 PROJECT OBJECTIVES

The primary objectives of the removal action at the OFFTA site are to excavate and remove all remaining potential sources of petroleum contamination to comply with applicable regulatory criteria and construct a stone revetment along the shoreline to prevent the erosion of soil and fill into Coasters Harbor. There are multiple known potential sources of contamination:

- one manhole and chamber potentially associated with a former oil-water separator,
- two drainage pipes (one of which has yet to be located),
- one concrete apron structure that formerly held burn-pits and tanks, and
- one soil “hot-spot” of petroleum contamination, and remaining foundation structures.

The cumulative volume of material to be excavated during these activities is estimated as approximately 2,600 cubic yards although this may be changed due to conditions encountered. Figure 1-2 depicts the areas of the site where work will be conducted.

To achieve the first Removal Action Objective, the contaminated soil and subsurface structures will be excavated, demolished into smaller pieces as necessary, sorted and sampled in accordance with this work plan, hauled to an on-site staging area, and ultimately reused on-site (soil < 2,500 mg/kg TPH) or transported off-site to an appropriate disposal facility (soil > 2,500 mg/kg TPH). Confirmatory soil samples will be collected from the base and sidewalls of each excavation area to demonstrate that all media exceeding the criteria of 30,000 mg/kg TPH has been removed. Each excavation subsequently will be backfilled with clean soil (imported soil not exceeding 500 mg/kg TPH in upper 2 feet; on-site soil and make-up soil as needed not exceeding 2,500 mg/kg TPH below 2 feet) and seeded to promote regrowth of the surface vegetation. Additionally, test-pits will be excavated at ten on-site locations (to be determined by the RIDEM and United States Environmental Protection Agency [EPA] after known removals are complete) to confirm that no other potential sources of contamination exist in the subsurface soil. If other potential sources of contamination are found, then they also will be excavated and disposed off-site in accordance with the substantive elements of this work plan. The decision tree provided as Figure 5-1 will determine if conditions encountered indicate presence of an additional source or source area.

To achieve the second Removal Action Objective, a replacement stone revetment will be constructed. The shoreline at the site has previously stabilized from erosion by a mixture of natural and man-made materials, including stone, asphalt, concrete, brick, etc. This material will be removed and replaced with an engineered stone revetment that will key into existing slopes and prevent any soil erosion from the site. Soil and debris excavated from the shoreline will all be removed from the site and disposed of in accordance with applicable regulations. Figure 1-2 depicts the general location of the new revetment. A design for a replacement stone shoreline revetment will be prepared and submitted for review by the stakeholders. A Construction Quality Control Plan will also be prepared to describe critical elements of the revetment construction, including the removal of soil and shoreline sediment, protection of critical habitats, and confirmation sampling as required.

It is anticipated that two phases of the project will be conducted, the first to remove known contaminated soil and foundations, and the second to remove and replace the stone revetment. This document describes only the first phase of this removal action, consisting of removal of contaminated soil and structures.

These Removal Action Objectives have been determined to be complimentary to any selected final remedy for the OFFTA site (TtNUS Action Memorandum, 2006; Appendix A). The specific tasks associated with accomplishing the on-shore objectives are described in detail within this work plan.

2.0 PROJECT MANAGEMENT

The TtNUS Construction Management Team will be responsible for all technical and administrative aspects of the remediation project. The technical responsibilities of the team will include: assuring that all remediation activities are completed in accordance with this work plan; management of construction activities including work performed by remediation subcontractors; and complying with all applicable local, state, and federal regulations. Included among the teams administrative responsibilities are establishing and maintaining project communications, controlling cost and schedule of the project, document control, and conducting routine project status meetings.

2.1 CONSTRUCTION MANAGEMENT TEAM ORGANIZATION

The following general positions are considered as key Construction Management team members for the performance of this project. Other support staff (QA, safety, and management staff) is anticipated to be involved on a supervisory level and therefore not explicitly defined for this work plan. A project organization chart is attached as Appendix C.

Project Manager: The responsibility of the Project Manager will be to provide general oversight of all facets of the project. He will be responsible for the oversight, resource allocation, scheduling, and quality control of the project. He will report to the Navy Contracting Officer (NAVFAC) and is the first point of contact for the Contracting Officer's Technical Representative presumed to be the Navy Resident Officer in Charge of Construction (ROICC).

Construction Manager: The Construction Manager will be responsible for all on-site construction activities including supervision of remediation subcontractors. The Construction Manager will report directly to the Project Manager and ROICC and will interface with the Project Engineer and Site Quality Control Representative on a daily basis to ensure that quality control standards are met.

Project Engineer: The responsibility of the Project Engineer will be to provide guidance to field construction staff relating to compliance with the RIDEM Remediation Regulations and RA work plan, and prepare technical plans and submittals. The Project Engineer will report to the Project Manager.

Subcontract Manager: The Subcontract Manager will be responsible for procurement of subcontractors and will report to the Project Manager.

Health and Safety Manager: The Health and Safety Manager (HSM) will be responsible for general oversight of the health and safety procedures used on this project. He will consult with and give direction to the Site Health and Safety Officer.

Site Health and Safety Officer: The Site Health and Safety Officer (SHSO) will be responsible for the overall health and safety of all employees on-site. The SHSO will be responsible for daily health and safety monitoring, implementation of all health and safety procedures and requirements, and maintenance of health and safety records. The SHSO will have the authority to shut down any operation that is deemed by him to be unsafe. He will report to the HSM and interface closely with the Construction Manager.

Oversight Engineer: An independent oversight engineer [Navy Resident Officer in Charge of Construction (ROICC) or NAVFAC representative] will be provided by the Navy to monitor project activities, financial expenditures, and waste quantities generated.

2.2 REMEDIATION SUBCONTRACTOR PROCUREMENT

TtNUS will procure an environmental remediation firm as its subcontractor to implement the construction phase of the OFFTA Site removal action. Only firms that are experienced in the main elements of this project (soil excavation and site restoration), are qualified to work on hazardous waste sites, and have the necessary personnel to adequately perform the work in accordance with the requirements of an approved HASP will be eligible for this subcontract. To be considered firms must have proven competence in five factors (project experience, personnel, equipment, health and safety, and financial). In addition, firms with an unacceptable health and safety record will not be considered qualified.

2.3 PROJECT COMMUNICATION

Communication between the Construction Management Team and NAVSTA Security, Public Works, NAVSTA Environmental, and other departments will be through the Construction NTR in the office of the ROICC or another NAVFAC representative. The Navy will notify the EPA and RIDEM regarding all field activities. Specifically, advance of notice of one week will be provided prior to the start of field activities, and 24-hour notification will be given for the cancellation of activities whenever possible. Further, to account for the dynamic nature of the work schedule, the Navy each week will notify the EPA and RIDEM via email of the weekly schedule of upcoming activities.

2.4 PROJECT SCHEDULE

In accordance with the Action Memorandum, the construction schedule for implementation of the Removal Action is as follows:

Milestone	Proposed Start Date	Proposed Completion Date
On-shore Removal Action Work Plan *	10/1/06	9/15/07
Soil Excavation and Removal	11/28/07	4/24/08
Removal Completion Report	4/24/08	12/11/08
Replacement Stone Revetment Design *	5/1/07	3/15/08
Replacement Stone Revetment Construction	6/1/08	11/1/08
Replacement Stone Revetment Completion Report (As-Built)	11/1/08	1/1/09

*Tasked under CLEAN Contract N62472-03-D-0057, CTO 65. All dates are subject to funding constraints.

2.5 DOCUMENT CONTROL

Quality control records, field and laboratory test reports, submittals and approvals, as-built drawings, changes to the contract, updated construction schedules, invoices, daily reports, and all other project record documents, as required, will be maintained in the project files. The files will be located in the site office and available for review by the Navy.

Technical changes to the work identified by the Construction Management Team, technical questions concerning regulations and specifications, and reporting of non-conforming items will be documented in writing by the Project Manager after approval by the Navy. Such documentation will be prepared by members of the construction management team and distributed to the Navy for disposition. Copies of these documents will be maintained in the project files. Samples of the reports, the formats to be used for the reports, and the daily reports will be included in a Construction Quality Control (CQC) Plan prepared by the construction management team after that contractor is selected.

2.6 PROJECT MEETINGS

Pre-Construction Meeting: Before commencement of work on-site, the construction management team, remediation subcontractor project staff, the Navy, and their representatives will meet to discuss coordination of the project. Items discussed in this meeting will include access to the site, working hours, specific health and safety issues, and general scheduling of the work. Summary notes of this meeting will be recorded by the RA Contractor and provided to attendees within five business days of the meeting. Appendix D contains a suggested agenda for this meeting.

Project Start Meeting: A meeting will be held on-site with the EPA and RIDEM to explain the project plan and process for conducting the work. Summary notes of this meeting will be recorded by the Project Manager and provided to attendees within 5 business days of the meeting.

Weekly Quality Control (QC)/Progress Meetings: QC/Progress Meetings with the Navy will be conducted once each week on Monday. The meetings will be held at the Construction Manager field office unless otherwise requested by the Navy. Meeting notes will be distributed by email or fax within 2 business days of the meeting. Appendix D contains the proposed agenda for these meetings.

Monthly QC/Progress Meetings: QC/Progress Meetings with the Navy, EPA, and RIDEM will be conducted once each month on-site. Meeting notes will be distributed by email or fax within 5 business days of the meeting.

3.0 FIELD ADMINISTRATIVE PROCEDURES

3.1 DAILY SAFETY MEETING

The remediation subcontractor supervisory personnel will hold daily safety meetings to advise workers of proper methods for performing the work planned for the day. The topics of discussion will be listed on a sign-in sheet, which will be kept as a record of the meeting.

3.2 STATUS REPORTS

Every day that work is performed, the construction manager will prepare and submit a Daily Report to the Navy ROICC. The report will summarize the daily construction activities, soil quantities excavated and transported, pay items, manpower and equipment used, materials and equipment received, quality control testing and inspection performed, and quantity of material removed and/or brought to the site. The report will be submitted to the Navy on the following business day. Weekly, the project manager will summarize the contents of the Daily Reports for submittal to the Navy, EPA, and RIDEM.

Additionally, the project manager will prepare monthly status reports on the current condition of the project. The status reports will include a Technical Progress Report, Non-Compliance Report, Cost Performance Report, Project Schedule, updated Submittal Register, Government Materials Tracking Report, Variance Analysis Report, and Waste Materials Report.

3.3 SUBMITTAL REGISTER

The construction manager will prepare and continually update a Submittal Register to document quality control for materials, inspection, and testing. The Submittal Register will be maintained on-site and available for review.

3.4 PHOTOGRAPHIC LOG

The construction manager will document progress and final inspection using photographic documentation.

3.5 REGULATORY AGENCY PERSONNEL SITE VISITS

Regulatory agency personnel who visit the site and have questions or comments concerning the work will direct those questions or comments, in writing, to the Project Superintendent, who will then forward them to the Navy Technical Representative.

4.0 REGULATORY OBJECTIVES

In accordance with the Action Memorandum, the primary remedial objective governing the project is the RIDEM Upper Concentration Limit (UCL) for soil of 30,000 mg/kg for TPH (RIDEM Remediation Regulations, Section 8.07; DEM-DSR-01-93). The work as described in this RA Work Plan will meet the applicable requirements of the regulations and policy documents as listed below:

- Coastal Zone Management Act (16 USC Parts 1451 et. seq.) – Actions will meet applicable coastal zone management requirements and protect resource areas.
- Floodplain Management (Executive Order 11988; 40 CFR Part 6, Appendix A) – Actions will preserve beneficial value of the floodplain.
- Clean Air Act (CAA), National Emission Standards for Hazardous Air Pollutants (NESHAPS) (USC 7411, 7412; 40 CFR Part 61) – Requirements for monitoring of air emissions will be met; activities will be carried out in a manner which will minimize potential air releases.
- Resource Conservation and Recovery Act (RCRA), Subtitle C – Standards for Hazardous Waste Facilities (42 USC 6291 et seq.) – Soils and debris will be tested, and if hazardous, handled and disposed according to standards.
- Resource Conservation and Recovery Act (RCRA), Subtitle D – Standards for Solid Waste Facilities (40 CFR 262.1) – Soils and debris will be tested, and if non-hazardous, handled and disposed according to standards.
- Clean Water Act (CWA), Section 402, National Pollutant Discharge Elimination System (NPDES) (33 USC 1342; 40 CFR Parts 122-125, 131) – Regulated discharges into surface waters will meet ambient water quality criteria.
- RIDEM Remediation Regulations (DEM-DSR-01-93, as amended August 1996 and August 2004) – Removal will be directed by presence of soil exceeding upper concentration limits for petroleum (>30,000 mg/kg)
- RIDEM Solid Waste Regulations (DEM OWM-SW04-01) – Actions will be conducted in accordance with applicable solid waste requirements.
- Rhode Island Coastal Resources Management (RIGL 46-23-1 et seq.) – Actions will be conducted in accordance with applicable coastal resource management requirements.
- Rhode Island Clean Air Act – Fugitive Dust Control (RIGL 23-23 et seq.; CRIR 12-31-05) – Actions will take reasonable precaution to prevent particulate matter from becoming airborne.
- Rhode Island Clean Air Act – Emissions Detrimental to Persons or Property (RIGL 23-23 et seq.; CRIR 12-31-07) – Actions will prevent airborne emissions of contaminants that may be injurious to humans, plant or animal life or cause damage to property.
- Rhode Island Clean Air Act – Air Pollution Control (RIGL 23-23 et seq.; CRIR 12-31-09) – Removal action air emissions will be monitored and emissions controlled if necessary.

- Rhode Island Clean Air Act – Air Toxics (RIGL 23-23 et seq.; CRIR 12-31-22) – Removal action air emissions will be monitored to assess compliance and operation and maintenance activities carried out in to minimize potential air releases.
- Rhode Island Hazardous Waste Management Standards for Treatment, Storage, and Disposal Facilities (RIGL 23-19.1 et seq.; CRIR 12-030-003) – Soils and debris will be tested, and if hazardous, handled and disposed according to standards.
- Rhode Island Oil Pollution Control Regulations - Petroleum in groundwater will be removed; releases to surface water will be prevented through use of appropriate containment structures and maintaining sufficient distance between the stockpiles and shoreline.
- Rhode Island Water Pollution Control Regulation – Releases to surface water will be prevented.
- Rhode Island UST and LUST regulations – Underground tanks and support systems found will be removed in accordance with applicable requirements as described in this work plan.

5.0 REMOVAL OVERVIEW

This phase of the Removal Action for the site includes excavating target structures and petroleum-contaminated soil, and conducting exploratory excavations (test pits) to locate additional contaminant sources. The active work areas, identified on Figure 1-2, will be excavated to remove target structures and find and remove all soil exceeding the Action Level of 30,000 mg/kg TPH. These areas will then be backfilled using imported soil (not exceeding 500 mg/kg TPH) in the surface 2 feet and existing on-site soil not exceeding 2,500 mg/kg TPH below 2 feet. In addition, available mobile non-aqueous phase liquid will be removed from the excavations if encountered.

5.1 EXCAVATION AREAS

The excavation areas are described as follows:

- One manhole structure (Area C), located in the eastern-central portion of the site, will be excavated and removed first. It will be opened, inspected and sampled, emptied, and then it and any associated structures (such as a potential oil-water separator) will be excavated, demolished, and removed. This manhole excavation is anticipated to incorporate an area of approximately 730 square feet, extend to 8 feet below ground surface, and involve removal of approximately 92 cubic yards of soil and 11 cubic yards of reinforced concrete. Additionally, any piping found leading to or from this location will be inspected and sampled for evidence of petroleum contamination. If contamination is detected above the Action Level of 30,000 mg/kg TPH, additional excavation will be conducted to remove the contaminated piping and any associated structures. The Remediation Subcontractor will use the Excavation Decision Tree presented as Figure 5-1 to determine the appropriate course of action as the excavation progresses.

- Secondly, two 8-inch-diameter cast iron drainage pipes will be removed if found (Areas B1 and B2). The one known drainage pipe (Drainage Pipe 1) will be removed along with an estimated 260 cubic yards of soil. If the second drainage pipe (Drainage Pipe 2) is successfully located, then it also will be removed along with an additional 260 cubic yards of contaminated soil. Based on historic drawings (Appendix B), it appears that Drainage Pipe 1 is a remnant sanitary drain from Building 144. Additionally, these drawings suggest that Drainage Pipe 2 is a drain from Manhole Structure 1. Therefore, following removal of Manhole Structure 1, the removal of Drainage Pipe 2 will precede the removal of Drainage Pipe 1. Each drainage pipe excavation and removal is anticipated to impact an area of 1,500 square feet and extend to a depth of 8 feet below ground surface. To ensure completeness of these removal actions, any piping found leading to or from the drainage pipes will be inspected and sampled for evidence of petroleum

contamination. If contamination is detected above the Action Level of 30,000 mg/kg TPH, additional excavation will occur to remove the contaminated piping and any associated structures. The remediation subcontractor will use the Excavation Decision Tree presented as Figure 5-1 to determine the appropriate course of action.

- Thirdly, the concrete apron (Area D), located in the eastern-central portion of the site, will be excavated and removed as necessary to facilitate investigation and sampling of the underlying soil. This concrete excavation is anticipated to incorporate an area of approximately 3,900 square feet, extend to 1.5 feet below ground surface, and involve removal of approximately 86 cubic yards of soil and 200 cubic yards of reinforced concrete. Additionally, any piping found leading to or from this location will be inspected and sampled for evidence of petroleum contamination. If contamination is detected above the Action Level of 30,000 mg/kg TPH, additional excavation will occur to remove the contaminated piping and any associated structures. The remediation subcontractor will use the Excavation Decision Tree presented as Figure 5-1 to determine the appropriate course of action.

- Following removal of the concrete apron, one soil hot-spot (Area A), located in the northern-central portion of the site and previously found to contain TPH at concentrations above 30,000 mg/kg, will be excavated. Additional sampling of Area A to further define its limits has not been conducted since 2005; therefore, initially the Navy will excavate 4,400 square feet in the vicinity of Area A, and expand the excavation as necessary based on the results of confirmation sampling. It is estimated that the depth of the excavation will extend to 8 feet below ground surface, and involve the removal of approximately 1,000 cubic yards of soil. Excavation will continue until confirmatory sampling results all indicate that all soil with TPH concentrations above 30,000 mg/kg has been removed.

- Ten test pits, with varying surface dimensions, will be advanced at the site; these locations will be determined by the EPA and RIDEM throughout the duration of the project. A total of 62 cubic yards of material is anticipated to be excavated during advancement of each of these test pits; however, the excavated material will be immediately replaced if soils meet the backfill objectives described in this work plan. If additional potential sources of contamination are discovered during these excavations, then additional investigation, removal, and off-site disposal will be conducted accordingly. All additional work activities will adhere to the requirements of this work plan.

Three foundation structures (Foundations 1, 2, and 3), located in the central and eastern-central portions of the site, will be excavated and exposed to determine if they are likely to harbor contaminants at significant concentrations. As time and funding permits, these foundations may be removed.

These three foundation excavations would each presumably incorporate an area of 1,300 square feet, extend 6 feet below ground surface, and involve removal of 181 cubic yards of soil and 27 cubic yards of reinforced concrete. Additionally, any piping found leading to or from these structures would be inspected and sampled for evidence of petroleum contamination. Based on the sampling results, additional excavation would potentially occur to remove the contaminated piping and any associated structures. The remediation subcontractor would use the Excavation Decision Tree presented as Figure 5-1 to determine the appropriate course of action.

5.2 SORTING AND STOCKPILING EXCAVATED MATERIAL

Upon removal, all excavated media will sorted by type, broken into smaller pieces as necessary, and initially segregated visually into 10 cubic yards cast piles. The piles will be analyzed using flame ionization detector (FID) and Petroflag® screening tests, which can provide screening-quality results. Ten percent of the samples collected will also be submitted for analytical laboratory testing.

The FID readings will be obtained using the jar-headspace method, which consists of collecting soil into jars, covering the jars with aluminum foil, allowing the jars to acclimate to room temperature, and then carefully puncturing the aluminum foil with the FID probe to read the organic vapor concentrations. These readings will be considered qualitative only and Petro flag results will take precedence over FID results.

The Petroflag test, which is conducted based on EPA SW-846 Method 9074 using a proprietary handheld analyzer and the EPA procedure SW-846 8015B, is a turbidimetric screening analysis that works effectively with a wide range of fuels at a wide range of concentrations.

Based on the results of these analyses, the 10 cubic yards piles will be transported and placed at a temporary staging area located adjacent to Taylor Drive. The piles will be sorted at the staging area as follows:

Type	TPH Concentration (mg/kg) *	Use	Testing
Reusable Soil	TPH < 2,500	Backfill excavations on-site at depths > 2 feet below ground surface	screening tests 10% confirmation sampling by analytical laboratory
Petroleum-Impacted Soil	TPH > 2,500 < 10,000	Dispose off-site as petroleum-contaminated waste	screening tests 10% confirmation sampling by analytical laboratory
Type	**TPH Concentration (mg/kg) ***	**Use**	**Testing**
Potential Hazardous Material	TPH > 10,000	Dispose off-site potentially as hazardous waste, based on analytical laboratory results	screening tests 10% confirmation sampling by analytical laboratory
Subsurface Structures	-	Dispose or recycle off-site	Type of material (concrete, metal, wood, etc.)

* by screening test

The 10,000 mg/kg threshold will be used for stockpile designations because the screening analyses are not assured to be accurate, and this threshold will assure that heavily contaminated soils are not mixed with less contaminated soils. In addition, these initial screening analyses will serve only as a characterization for stockpiling purposes. Waste characterization samples will be collected from the stockpiled Petroleum-Impacted Soil and Potential Hazardous Material for laboratory analysis to accurately determine the nature of contamination and, accordingly, the appropriate on-site reuse or off-site disposal location. Based on the results of the waste characterization sampling, Petroleum-Impacted Soil may be reconsidered as reusable soil if the TPH results are below 2,500 mg/kg as confirmed by laboratory analysis. The volume of the staging area stockpiles will not exceed 100 cubic yards. Waste characterization sampling is further described in Section 9 of this work plan.

5.3 CONFIRMATION SAMPLING

Confirmation samples will be collected from the vertical and horizontal limits of each excavation area to demonstrate that the removal action objective has been achieved. If the confirmation sampling results indicate that non-compliant soil extends beyond the originally anticipated excavation limits, then excavation will continue under direction of the Project Superintendent and agreement by the regulatory parties. If the sampling results indicate that all remedial objectives have been achieved, then the excavation areas will be backfilled as described in Section 7.7 of this work plan. Confirmation sampling is further described below in Section 9 of this work plan; the specific construction activities to be conducted for completion of the work are delineated in Section 7.

5.4 NON-AQUEOUS PHASE LIQUID

During excavation, it is anticipated that measurable oily non-aqueous phase liquid (NAPL) will be generated by disturbance of soil in excavations that extend into the water table. The presence of measurable NAPL on the water table is considered an exceedance of an upper concentration limit in accordance with RIDEM remediation regulations Sections 8.07(A) and 3.43 and therefore will be removed from the site if encountered. The presence of sheen on standing water is not to be construed as a measurable NAPL. Measurable NAPL will be determined by the thicknesses of non-aqueous liquid ¼" or greater, measured by an oil-water interface probe. If sheen appears on the standing water within an excavation, oil sorbent pads will be applied to the water surface for a period of six hours and retrieved prior to back-filling the excavation.

6.0 REMOVAL ACTIVITIES

6.1 ANTICIPATED TASKS

The following major activities (not necessarily in the order listed) will be performed:

- DigSafe clearance
- Surveying
- Installation of sedimentation and erosion control measures
- Construction of temporary wheel-wash and decontamination facilities
- Abandonment of monitoring wells, as needed (identified on drawing)
- Establishment of exclusion zones and contamination reduction zones
- Construction of temporary staging area
- Excavation of contaminated soil and subsurface structures
- Excavation of ten test pits and, if necessary, removal of additional potential contamination sources
- Collection of soil samples for field screening, waste characterization, and confirmation of regulatory compliance
- Transportation and off-site disposal of contaminated media
- Transportation and disposal of general debris
- Backfilling of the excavated areas with imported and reused soil
- Reestablishment of vegetative cover where appropriate
- Replacement of monitoring wells, as needed
- Demobilization

6.2 CONSTRUCTION QUALITY CONTROL

A Construction Quality Control (CQC) Plan will be prepared by the Remediation Contractor for this project. Construction quality control will be performed on-site by the construction management team, who will be responsible for ensuring that construction conforms to the requirements of the RA work plan and RIDEM Remediation Regulations. This will include oversight of material testing, results documentation, reporting deficiencies, and certifying that all submittals are in compliance with contract requirements.

Quality control inspection and testing will be performed in accordance with the RA work plan, RIDEM Remediation Regulations, and CQC Plan. Testing will be conducted both on- and off-site. Subcontracted testing laboratories will be utilized for geotechnical and analytical testing.

6.2.1 Surveying

All sample stations presented on Figure 1-1 have been surveyed using various methods; 400 series locations and test pit locations were surveyed to within 0.1 foot horizontally and vertically. The 500 series locations were surveyed via Global Positioning System (GPS) technology to within 1 foot horizontally.

The CQC Plan will describe precisely how the prior sample locations and grid nodes will be accurately located and marked in the field. In addition, the Plan will discuss any maintenance of the mark-out points, which will occur as needed during construction.

6.3 HEALTH AND SAFETY REQUIREMENTS

A site-specific Health and Safety Plan (HASP) will be prepared by the remediation subcontractor to provide requirements to be utilized in the field for protection of worker health and safety. The SHSO will provide oversight of activities to ensure conformance with the HASP. The SHSO will be responsible for conducting site health and safety trainings and briefings, air and dust monitoring during operations, personnel monitoring, enforcing/modifying levels of personal protective equipment (PPE), ensuring compliance with decontamination procedures, maintaining monitoring equipment, and documenting and reporting all health and safety-related accidents or injuries.

The SHSO will conduct regular site safety inspections. Weekly and monthly reports will be prepared and submitted to the Health and Safety Manager. Daily health and safety reports will also be prepared and submitted with the daily report.

The following components of the HASP will affect the daily activities of workers:

- A hazard assessment that identifies chemical, physical, and biological hazards associated with the project. Activity hazard analyses will be prepared to define the specific risks and means of mitigation associated with daily construction activities.
- Control measures to reduce the risk of exposure to chemical, physical, and/or biological hazards.
- Specific training requirements required for workers to operate at the site.
- Guidance regarding control of site operations, use of PPE, site safety equipment, and on-site communications
- Establishing and maintaining the exclusion zone
- Real-time air monitoring and medical surveillance procedures.
- Decontamination procedures, including contamination prevention, personnel decontamination, equipment decontamination, and disposal procedures.

6.4 PROCEDURES FOR DECONTAMINATION

This section describes the procedures that will be employed to ensure that both personnel and equipment are free from contamination when leaving the work site, either at the end of each day, during scheduled breaks, and/or upon completion of the project, when leaving a contaminated or potentially contaminated area and entering a clean one, and when completing a task involving handling contaminated material prior to beginning a clean task. These decontamination procedures will be included within the site-specific HASP.

6.4.1 Personnel Decontamination

The following site activities will present the potential for personnel contamination:

- Excavation and stockpiling of soil and other waste material
- Decontamination of equipment

The remediation subcontractor will apply engineering and/or work practice controls as a means of protecting personnel during performance of site-specific tasks. Engineering controls will be implemented to reduce and maintain employee exposure at or below safe levels for those tasks involving possible exposure to contaminants. When engineering controls are impractical or insufficient to protect employees during site operations, the remediation subcontractor will designate use of PPE to perform certain tasks.

Any personnel exposed to possible contamination during daily activities will follow decontamination procedures outlined in the HASP. Decontamination procedures will ensure that any material that workers may have contacted in the Exclusion Zone (EZ) does not cause personal exposure and is not spread to clean areas of the site. The EZ will be limited to work areas considered or suspected to be contaminated; this designation will be revised and updated daily as waste material is exposed and subsequently backfilled.

6.4.2 Equipment Decontamination

All contaminated equipment will be decontaminated when switching from a contaminated task to a clean one and prior to being demobilized from the site. Decontamination procedures may include sweeping, wiping, scraping, or steam-cleaning equipment, including reusable waste containers. Personnel performing decontamination tasks will wear the proper PPE as specified by the HASP. Off-site vehicles that travel through contaminated portions of the site will have their tires washed prior to exiting the site. The exteriors of the vehicles will also be inspected to assure that they are free of any contaminated soil.

6.4.3 Disposal

Decontamination solids and used PPE will be collected and disposed of at an approved off-site disposal facility. These materials will be sampled and characterized as required by the disposal facility prior to removal from the site. Decontamination liquids will be allowed to flow on to the surface of a contaminated area until such time that the area has been remediated. When all contaminated areas of the site have been remediated, decontamination liquids will be collected, placed in United States Department of Transportation (DOT)-approved 55-gallon drums or other acceptable field container, sampled, and disposed of at an approved off-site disposal facility.

6.5 SITE SECURITY/SITE ACCESS

The remediation subcontractor will maintain security at the site by installing security gates across all entrances to the work area. These gates will be locked by remediation subcontractor personnel at the end of each work day. Additionally, warning signs will be posted at the site entrance to deter people from entering. Access to the site will be monitored by use of a sign-in sheet located in the office trailer. Signs will be posted at the site entrance informing visitors to sign in upon arrival.

7.0 REMEDIAL CONSTRUCTION

This section provides a description of the major tasks that will be performed to accomplish the project. Tasks will be performed in accordance with the Action Memorandum, RA work plan, CQC Plan, and site-specific HASP.

7.1 MOBILIZATION

Temporary construction offices and facilities, lay down, staging, and material storage areas will be installed as part of the mobilization task. Temporary facilities may include an office trailer, washroom trailer, one or more storage containers, and portable toilets. Utility connections will be made for power, water, and telephone and internet communications. Utility work will be coordinated first with the public DigSafe and secondly with the Navy Public Works Department. Arrangements will be made for mail delivery and solid waste and sewage disposal services. Administrative staff, craft labor, and equipment will be mobilized to the site as part of this task.

7.2 SITE PREPARATION

7.2.1 Erosion and Sedimentation Controls

Prior to site disturbance, the remediation subcontractor will prepare a Stormwater Pollution Prevention Plan, which will include a description of how the soil erosion and sediment control devices will be constructed. Silt fence will be installed along the perimeter of active excavation areas and the shoreline within 100 feet of excavation areas, and along the downgradient and lateral gradient sides of the temporary staging area. Along the shoreline, silt curtains and other barriers will be installed on the seaward perimeter to control migration of contaminated soil and sediments prior to initiation of work. Additionally, stormwater diversion swales will be constructed as necessary upgradient of the on-shore work areas and staging area to prevent surface water from flowing into these areas. Inspection of the erosion and sediment controls for potential damage will occur daily and after each significant precipitation event (greater than 0.25 inches in less than 12 hours) or after any event that has potential to damage the controls.

7.2.2 Site Survey

An initial site survey will be conducted to establish the controls required for performing routine construction surveys. The horizontal and vertical locations of several existing landmarks will be verified

with the site topography map prior to beginning the initial site survey. The initial site survey will be performed by a licensed surveying company.

7.2.3 Monitoring Well Abandonment/Replacement

Monitoring wells within the excavation areas, haul road, and staging area footprints will be abandoned as necessary. Monitoring wells will be abandoned in accordance with Appendix 1, Section 13 of the State of Rhode Island Final Regulations. PVC standpipe materials will be disposed off-site as solid waste. Any abandoned wells will be replaced at the completion of the project in accordance with the monitoring well specifications contained in Appendix E.

7.2.4 Clearing

Clearing will be performed as necessary within the limits of disturbance. Trees and brush will generally be cleared to 6 inches above the ground surface. Any wood debris generated from the clearing activities will be processed through a chipper to create wood chips of 4-inch diameter maximum particle size. The wood chips will be stockpiled on-site and spread over the site upon completion of the remedial activities. Tree stumps and root balls that remain in any excavation area after clearing is complete will be excavated with the contaminated soil and disposed of off-site.

7.2.5 Site Haul Roads

A single haul road will be established in designated sections of the site. A potential location for the haul road is depicted on Figure 1-2. The existing material on-site will be used as the base for the roads and crushed stone will be used as needed to provide a travel surface over clean areas. Trucks that come in contact with a contaminated portion of the site will have their tires and wheel wells pressure-washed prior to leaving the site. Pressure-washing will be performed on a stone wheel-wash pad, which will be constructed of 2- to 4-inch riprap and located near the exit to Taylor Drive. The portions of the haul road that overly clean sections of the site will have approximately 3 inches of soil removed from the surface of the road once use of the road has ceased. The soil will be appropriately placed in the soil staging area to undergo waste characterization sampling and possible disposal off-site or reuse on-site. Samples of the soil underlying the haul road will be collected prior to commencement and upon completion of the remedial work to demonstrate that surface soils are compliant with the RIDEM I/CDEC. If the sample results indicate that contaminant concentrations exceed applicable regulatory criteria upon completion of the project, then additional soil will be provided as cover material. Otherwise haul road stone will be allowed to remain upon completion of the project. Sampling will be performed in accordance with the baseline sampling procedures described in Section 9 of this work plan.

7.2.6 Decontamination Facilities

Personnel and equipment decontamination facilities will be established adjacent to Taylor Drive. The personnel decontamination facility will consist of an area where personnel can don proper PPE prior to entering the EZ and remove the PPE prior to exiting. The area will be clearly marked with high visibility tape and/or fencing. The equipment decontamination facility will consist of a 2- to 4-inch stone layer approximately 15 feet wide by 20 feet long. Equipment will be walked on to the layer of stone and pressure-washed prior to exiting the EZ.

7.3 STAGING AREA PREPARATION

All soil excavated from the site will be transported and stockpiled at a temporary staging area. A potential location for this staging area is indicated on Figure 1-2. Approximately 12 inches of existing soil within the staging area footprint will be removed and temporarily stockpiled in a separate "clean" area. Physical barriers will be set at the staging area surface to segregate the staging area into four separate areas. A 40-millimeter-thick polyethylene liner or similar barrier will then be installed over the staging area subgrade for containment of the excavated soil. Water that collects within the stockpile area will be pumped, if necessary, containerized and sampled for treatment or disposal.

Access to the temporary staging area by vehicles hauling contaminated soil will be gained using restricted sections of the site. Off-site disposal trucks will access the staging area using Taylor Drive and the haul road. Upon completion of the excavation and hauling activities, approximately 3 inches of soil will be removed from those portions of the site used as roadways. The soil will be placed in the appropriate stockpile within the temporary staging area for reuse on-site. Soil samples will then be collected from the roadway areas to demonstrate that no residual contamination remains. The specific sampling activities are discussed in Section 9 of this work plan.

7.4 EXCAVATION

With the exception of the test pit excavation locations, soil excavation will generally be conducted within the footprints of the subsurface structures and soil hot-spot depicted on Figure 1-2. The limit of the soil hot-spot area was mapped out by TtNUS based on sample locations that exceeded the RIDEM UCL for TPH as determined by previous site investigations. Field screening, laboratory confirmation sampling, and visual inspection will be conducted during the soil excavation activities to accurately delineate vertical and horizontal limits of contamination.

Excavation will begin once a given area has been staked out by the surveyors and the necessary erosion and sedimentation controls are in place. Soil and the subsurface structures will be excavated; sorted by type; cast into 10 cubic yards piles based on visual observation; screened using FID, Petroflag, and laboratory analyses (10 percent frequency); stockpiled based on the results of the screening analyses; tested for waste characterization parameters; and ultimately reused or disposed off-site. The initial depth of excavation at the soil hot-spot will be based on the depth of contamination reported in the Soil Pre-Design Investigation Report. Excavation of the potential contamination sources, including any potentially contaminated structures identified during the planned work activities, will proceed as specified in Section 5.0. Excavation of the test pits will be conducted as requested by the RIDEM and EPA.

It is estimated that 1000 cubic yards of material will be excavated from the soil hot-spot (approximately half is anticipated to be returned as backfill if it contains TPH <2500 mg/kg); approximately 286 cubic yards of material will be excavated in conjunction with removal of the concrete apron; approximately 92 cubic yards of material will be removed along with the manhole/chamber structure; and an estimated 260 cubic yards will be excavated along with each drainage pipe (approximately half is anticipated to be returned as backfill if it contains TPH <2500 mg/kg). The final volume of material excavated at the test pit locations will depend on what is identified during the work. Excavation of targeted subsurface structures and soil hotspots will continue until field screening and laboratory confirmation sampling demonstrates that the Removal Action objectives (UCLs) have been achieved. Figure 5-1 is the Excavation Decision Tree to be used by the remediation subcontractor to determine the appropriate courses of action.

High visibility fence and/or caution tape will be placed around open excavations, where necessary, to clearly mark the areas. In addition, a minimum separation of 20 feet will be maintained between open excavation areas (including any cast piles) and areas being backfilled to minimize the possibility of cross-contamination.

Appendix F presents the calculations used to estimate the excavation volumes for the known potential contamination source areas. The excavation volume for installation of the stone revetment will be included in the separate revetment design document.

Excavations may be extended based on the finding of additional structures and piping associated with former source area features. The historic drawings provided in Appendix B depict these possible source area features, and these drawings will be used to confirm and identify features found during excavation.

Figure 1-3 depicts the historic subsurface structures in relation to current site features.

7.4.1 Non-Aqueous Phase Liquid

During excavation, it is anticipated that measurable oily non-aqueous phase liquid (NAPL) will be generated by disturbance of soil in excavations that extend into the water table. The presence of measurable NAPL on the water table is considered an exceedance of an upper concentration limit in accordance with RIDEM remediation regulations Sections 8.07(A) and 3.43 and therefore will be removed from the site if encountered. The presence of sheen on standing water is not to be construed as a measurable NAPL. Measurable NAPL will be determined by the thicknesses of non-aqueous liquid ¼" or greater, measured by an oil-water interface probe (refer to Appendix G).

If NAPL is encountered in standing water during excavation, the Construction Manager will notify the Navy or its representative, and the remediation subcontractor will be directed to remove that material by pumping from the excavation into temporary storage tanks located at the site, along with the groundwater anticipated to be contaminated. The remediation subcontractor will continue pumping groundwater contaminated with non-aqueous phase liquid until directed to stop by the Navy or their representative.

After the limits of the excavation have been reached, the excavation will be allowed to remain open and recharge for a period of 12 hours (overnight) to see if additional NAPL accumulates into the excavation. If measurable NAPL appears, that material and the associated groundwater will again be removed at the discretion of the Navy or their representative and the excavation will again be allowed to return to a steady state condition. This process will be conducted for a maximum of three cycles at the Navy's discretion prior to backfill. Additionally, if it is believed that NAPL will continue to seep out of adjoining soil into an excavated area after backfill, a low-cost passive NAPL collection system will be installed in the excavation. The collection system would be sized appropriately to fit the excavation, and the design would not be overly elaborate, potentially consisting of two-inch crushed stone surrounding 4-inch PVC recovery well(s). Any collection system design would be developed in consultation with regulators prior to installation, and will accommodate surrounding conditions so as not to provide a contaminant flow pathway.

If sheen appears on the standing water within an excavation, oil sorbent pads will be applied to the water surface for a period of six hours and retrieved prior to back-filling the excavation.

7.5 DEWATERING

Some excavations conducted at the site will extend into the standing water table. Depths of excavation may extend to 8 feet below ground surface and the water table has been found to be at approximately 6 feet below ground surface. If excavations need to be conducted below the water table, excavations may

require occasional dewatering operations to control water during work periods. Water will be controlled by pumping accumulated water as needed into temporary storage tanks located at the site. Dewatering will be conducted at the General Contractor's discretion, and after approval of the Navy or their representative, only for the purpose of meeting the removal action objectives described elsewhere in this work plan.

If dewatering of the excavated soil is required, it will be performed within the limit of the excavation area from which the soil was excavated or in the temporary staging area. Dewatering within the excavation areas will be accomplished by placing the excavated material into a pile and allowing gravity to drain the free water onto the surface of the excavation area. Dewatering at the stockpile area will be accomplished by placing the excavated material into a pile, allowing gravity to drain the free water onto the surface of a 40-mil polyethylene liner, and then pumping the water into DOT-approved 55-gallon drums for treatment and/or disposal off-site. Dewatering within active excavation areas will only be performed in sections not yet remediated.

7.6 STAGING OF EXCAVATED MEDIA

Excavated media will be staged in four separate stockpiles at the temporary staging area based on the media type and field screening results, as described in Section 5.0. The temporary staging area will be maintained by the remediation subcontractor daily. The four stockpiles will be covered with polyethylene sheeting while not in use. Caution tape will be placed across the staging area entrance at the end of each day. Excavated soils will remain in the staging area until waste characterization sampling and analysis has been completed. Excavated materials designated for off-site disposal will be removed off-site as needed, based on space limitations of the temporary staging area. In addition, the volume of any stockpile at the staging area will not exceed 100 cubic yards. Refer to Section 9.0 for sampling procedures.

7.7 BACKFILL

The excavated areas will be backfilled with imported common borrow material (surface two feet) and existing soil reused from the on-site excavations (below two feet). Soil backfilled into the upper 2 feet of the site will be imported from off-site sources and not exceed 500 mg/kg TPH; soil backfilled below 2 feet will not exceed 2,500 mg/kg TPH. Imported common borrow will be a clean, unclassified material with soil characteristics that allow it to be compacted to 95 percent of ASTM D698. The material will have a six-inch maximum particle size and be free of debris, roots, wood, scrap metal, vegetation, refuse, soft unsound particles, and frozen, deleterious, or objectionable materials. Backfill material will be installed such that the clean soil will not come in contact with material that remains to be excavated. Installation of

the backfill material will be in 1-foot lifts followed by compaction with a vibratory roller. In-place density testing of the compacted backfill will be performed at each excavation area to demonstrate that the material has been placed to achieve 85 percent of ASTM D698. If sections within an excavation area require backfill to be installed below the water table, then stone and/or geotextile will be installed to the top of the water table. In addition, if it is believed that NAPL will seep out of adjoining soil into an excavated area after backfilling is complete, a low-cost passive NAPL collection system will be installed in the excavation. The collection system would be sized appropriately to fit the excavation, and the design would not be overly elaborate, potentially with access points consisting of only vertical piping. Any collection system design would be developed in consultation with regulators.

The trucks importing backfill materials will access the site on the clean haul road and unload at the temporary staging area. As needed, the trucks' tires will be pressure-washed on the stone wheel-wash pad in order to ensure that any potential contamination is removed. Water generated from the pressure-washing activities will remain on-site. To minimize the amount of pressure-washing required, the haul road will be constructed near the target excavation areas.

7.8 OFF-SITE DISPOSAL

Excavated soils exceeding 2,500 mg/kg TPH will be disposed off-site following receipt of waste characterization analytical results and approval of a disposal facility. The disposal trucks will access the site using the haul road.

Soil that is designated for off-site disposal will be loaded from the temporary stockpile area onto disposal trucks. The disposal trucks will be loaded by a front-end loader that will remain in the stockpile area. All transportation and off-site disposal activities will be in accordance with local, state, and federal regulations.

7.9 COASTAL ACTIVITIES

The project work will be conducted in close proximity to the coastline; therefore, prior to commencement of excavation activities, the construction management team and remediation subcontractor will coordinate with the Rhode Island Coastal Resource Management Council (CRMC) to discuss any required permits. Typically, under CERCLA, if the RA meets the substantive requirements of the permits and regulations, the permit is not required. The construction management team will meet with CRMC to discuss requirements pertinent to the project and solicit comments on this and the associated design documents to meet the substantive requirements of the pertinent regulations.

7.10 SITE RESTORATION

Site restoration activities will be conducted to restore the site to its previous condition. The site will be restored by installing a layer of topsoil over the backfill material and seeding the area with grass. The backfill and topsoil will be used to restore the site to its existing grade as shown on Figures 1-1 and 1-2. Silt curtains will be removed from Coasters Harbor and washed if necessary. Silt fence and any remaining accumulated soil/sediment will be removed from all areas, characterized as necessary by the disposal facility, and sent off-site for disposal.

The temporary staging area will be restored by removing the 40-mil polyethylene liner and silt fence, both of which will be characterized as necessary by the disposal facility and disposed off-site. The liner will be inspected for signs of damage; if present, the underlying soil will be characterized before potentially being reused on-site. Soil that was stockpiled to create the staging area will be spread to match the surrounding grade and seeded with grass. Any fencing, gates, and site access roads will be removed or restored as required by the Navy.

7.11 DEMOBILIZATION

Following completion of the construction activities, all temporary facilities and utilities, personnel, equipment, and materials will be removed from the site and the support zone area will be restored. Construction equipment will be decontaminated before leaving the site.

7.12 DUST CONTROL

Dust control measures will be implemented, as necessary, during all construction activities. Water will be applied by a water truck to work areas, haul roads, and access roads as often as required to prevent visible dust threshold emissions. Additionally, routine dust monitoring will be performed.

8.0 MATERIAL HANDLING

The following material handling protocols will be implemented during this Removal Action to prevent contaminated soils from coming in contact with clean areas:

- Vehicles will travel on the dedicated roadway while hauling excavated material to the temporary staging area to minimize the potential for spreading surficial contamination to other sections of the site.
- Excavated material that requires dewatering will be dewatered within the excavation area whenever possible to minimize the volume of excess free water transported to the temporary staging area. If sufficient space is not available within an excavation area to allow for dewatering, then dewatering will be performed in accordance with Section 7.5 of this work plan.
- Prior to leaving an excavation area, the exterior of each truck will be inspected to ensure that no loose soil is present.
- The remediation subcontractor will establish a system for tracking soil stockpiles and associated sample results.
- All off-site trucks will remain on the clean haul road at all times. Any vehicles that travel through a contaminated section of the site, will have its tires and wheel wells pressure-washed prior to leaving the site.
- Any vehicle or piece of construction equipment that contacts a contaminated section of the site will be decontaminated prior to entering clean sections of the site.

9.0 SAMPLING ACTIVITIES

This section describes the sampling activities that will be conducted during the NTCRA to verify cleanup levels have been met and to characterize the excavated contaminated soils and other materials removed from the site for proper disposal. The remediation subcontractor will have primary responsibility for conducting these sampling activities. The TtNUS Construction Manager will collect split samples of the excavated soil from the remediation subcontractor to verify his analytical results. The remediation subcontractor will be required to prepare a QAPP describes the sampling system in terms of what media/matrices will be sampled, where the samples will be taken, the number of samples to be taken and the sampling frequency. The QAPP will identify the sampling locations and sampling and analysis methods. The split-sampling program will be detailed in an appendix to the CQC Plan.

The sampling program for removal actions will be limited to measurement of petroleum concentrations in soil using Petroflag screening and confirmation laboratory analysis. Samples will be screened using petroflag and 10% will be split for laboratory analysis using EPA method 8015 modified for extractable hydrocarbons C9 through C36 by GC (Diesel-Range Organics, or DRO). A running tally of results will be maintained by project staff and a Relative Percent Difference (RPD) of 50% will be considered acceptable for screening data as compared with laboratory data.

9.1 BASELINE SAMPLING

Surface soil samples previously collected throughout the site will serve as baseline samples; therefore, no additional baseline sampling will be required prior to commencement of the removal action.

Upon completion of the construction activities, a second set of samples will be collected from the same locations as the baseline samples to document the final conditions of the surface soil. The samples will be analyzed for TPH to confirm the conditions of the surface (0-1 feet) soil and assure that moving contaminated soil around the site has not caused these surface soils to become contaminated.

9.2 CONFIRMATION SAMPLING

Confirmation sampling will be performed at the excavation areas to demonstrate that the Removal Action objective has been achieved. Confirmation sampling will begin once the target object or soil area has been excavated. Confirmation sampling locations and results will be used to confirm that the project objectives have been achieved.

A minimum of one confirmation sample will be collected from each sidewall of each excavation area. The maximum horizontal spacing between sidewall samples will be 20 linear feet. The elevation along the sidewall will be selected by collecting and screening soil at the perimeter sampling locations at 1-foot vertical increments using FID and Petroflag analyses to determine the depth at which to collect the laboratory confirmation sample. The depth with the highest screening results will be designated as the sample location. Bottom samples will be collected on a 10-foot grid, with a minimum of four samples collected from the bottom of each excavation.

FID and Petroflag readings will be obtained using the methods described in Section 5.0. Selected confirmation samples will be submitted to a Navy-approved and RIDEM-certified laboratory for analysis. The Se samples will be analyzed for TPH. TPH will be measured as gasoline-range organics (GRO) (C5 to C12), and diesel-range organics (DRO) (C9 to C36) using EPA Method 8015 modified for extractable hydrocarbons.

All samples will be used as Points of Compliance in accordance with the RIDEM Remediation Regulations. Points of Compliance (30,000 mg/kg TPH in soil) shall be met to demonstrate compliance with the project objectives. In addition, the standing water in excavations will be evaluated to ensure that no NAPL remains.

Compliance with the soil Removal Action objective will be considered accomplished when all confirmation sample results demonstrate that contamination in excess of the applicable regulatory criteria (30,000 mg/kg TPH) has been successfully excavated. In the event that a confirmation sample indicates otherwise, excavation in that area will be extended 5 feet further and sample(s) will be collected again. Specifically, if contamination in a sidewall sample exceeds the criterion, excavation will be extended five feet further into that sidewall. If a bottom sample exceeds the criterion, excavation will be extended five feet deeper. The cross-sectional area of any additional sidewall or bottom excavation would be based on the area represented by the non-compliant sample; for example, a non-compliant sidewall sample representing 20 feet in width and 5 feet in depth would require additional excavation with dimensions 20x5x5 feet (18 cubic yards). Extended excavations will be resampled and the process will be repeated until compliance is achieved for all excavation areas in accordance with this work plan.

9.3 CAST PILES SAMPLING

Upon excavation, the soil and structures will be temporarily placed near the excavation area into 10 cubic yards cast piles based on material type, visual observances and previously collected data. These piles will then be sampled for FID and Petroflag screening analyses. The FID screening will be conducted using the jar headspace method, which is described in Section 5.2 of this work plan. The Petroflag

screening will be conducted by calibrating the Petroflag meter, collecting the sample into the Petroflag vial in accordance with the manufacturer's recommendations, and recording the screening results within 10-20 minutes after sample collection. In addition, recalibration of the Petroflag meter will be conducted once per 10 samples analyzed and also if the ambient temperature changes significantly.

To sort the soil excavated, the remediation subcontractor will collect eight-point composite waste characterization samples from each cast pile by dividing the pile into quadrants and collecting two sub-samples from each quadrant. The sub-samples will be collected from a minimum of six inches beneath the soil surface.

9.4 CONCRETE SAMPLING

Sampling of concrete for confirmation or for disposal will be conducted in accordance with the *EPA Region I Draft Standard Operating Procedure for Sampling Concrete in the Field*. The full text of this document is included as Appendix H.

9.5 WASTE CHARACTERIZATION SAMPLING

All material excavated from the site will be stockpiled in the temporary staging area in four separate stockpiles based on the field screening analyses described in Section 5.0. After the cast piles are characterized, they will be placed in a appropriate stockpile in the staging area. The soil stockpiles will be divided into soil containing less than 2,500 mg/kg TPH; greater than 2,500 but less than 10,000 mg/kg TPH; and greater than 10,000 mg/kg TPH. To fully characterize the soil stockpiles, the remediation subcontractor will collect eight-point composite waste characterization samples from each stockpile by dividing the stockpiles into quadrants and collecting two sub-samples from each quadrant. The sub-samples will be collected from a minimum of six inches beneath the stockpile surface. Although the sampling frequency may be determined by disposal facility requirements, the volume of each stockpile will not exceed 100 cubic yards of waste material. The samples will be analyzed for semi-volatile organic compounds (SVOCs), poly-chlorinated biphenyls (PCBs), Resource Conservation and Recovery Act (RCRA) 8 metals, TPH, flashpoint, pH, reactivity, and any other parameters required by the disposal facility. Also, volatile organic compound (VOC) characterization samples will be collected as grab samples. Analytical methods used will be standard EPA methods, and specified in the CQC Plan. Based on the results of the waste characterization sampling, soil will be designated for either off-site disposal if it exceeds 2,500 mg/kg TPH or on-site reuse as backfill (>2 feet below ground surface) if it does not exceed this criterion.

To minimize the quantity of soil stockpiled in the temporary staging area, the remediation subcontractor may collect waste characterization samples once a stockpile reaches a maximum volume of 100 cubic yards. Excavated soil that is placed in a stockpile after waste characterization samples have been collected will be staged separately and sampled during the next round of waste characterization. The off-site disposal facility for excavated soil exceeding 2,500 mg/kg TPH will be selected based on the complete waste characterization analytical results. All waste materials generated during the Removal Action will be labeled, stored, manifested, and transported as applicable in accordance with applicable state and federal regulations.

Liquid waste, including surface and subsurface water that collects in excavation areas of the site and requires pumping, will be containerized and characterized in accordance with the selected off-site disposal facility's requirements.

10.0 REGULATORY COMPLIANCE

10.1 WETLAND ACTIVITIES

Tidal wetlands are present in the revetment area as intertidal and subtidal areas protected by state and federal law. Installation of the revetment, which will be fully described in a separate document, will require disturbance of these wetlands. All work within the wetlands will comply with the requirements of Section 10 of the Rivers and Harbors Act of 1899 for work within navigable waters of the United States and Section 404 of the Clean Water Act for excavation and fill in jurisdictional wetlands. Compliance requires mitigation of disturbed wetlands and obtaining the appropriate Section 10 and 404 permits from the Army Corps of Engineers (USACE), as well as state authorizations administered by the Rhode Island Coastal Resources Management Council (CRMC) and RIDEM for 401 water quality certification.

It is anticipated that impacts to wetlands will be less than one acre; therefore, the related site work would be eligible for approval under an USACE Rhode Island programmatic general permit. In addition to coordinating with the USACE, the construction management team will coordinate all wetlands activities with the RIDEM wetland section and CRMC as necessary.

Tidal waters associated with the site are designated as Type 4 Waters under the Rhode Island Coastal Resources Management Program. Activities in Rhode Island's tidal waters, on shorelines abutting tidal waters, or within the 200-foot area landward and contiguous to all coastal features (top of the revetment, in this case) will require CRMC assent prior to conducting project activities. In addition, in accordance with CRMC regulations, its jurisdiction will likely extend to cover all project activities being conducted on-site.

Typically, under CERCLA, if the RA meets the substantive requirements of the permits and regulations, the actual permit is not required. The TtNUS construction management team and remediation subcontractor staff will meet with CRMC to discuss requirements pertinent to the project and solicit comments on this and the associated design documents to meet the substantive requirements of the pertinent regulations.

10.2 MONITORING WELL ABANDONMENT

Well abandonment procedures will conform to RIDEM well abandonment requirements as published in Section 13.2 of Appendix I of the Rules and Regulations for Groundwater Quality Monitoring Well Construction Standards and Abandonment Procedures. A well abandonment permit is not required. If monitoring wells are abandoned, TtNUS will submit an Abandonment Report to the RIDEM.

10.3 STORMWATER DISCHARGE FROM CONSTRUCTION ACTIVITIES

A National Pollution Discharge Elimination System (NPDES) Stormwater Permit for Construction Activities is not required to complete this CERCLA action. The project is not governed by specific effluent limitation or monitoring requirements, however no discharge of hazardous substances to surface water will be permitted. The site exceeds one acre in area; therefore, in accordance with the NPDES Phase II stormwater management regulations, the substantive requirements of a Rhode Island Pollution Discharge Elimination System (RIPDES) Permit for General Construction will be met. Formally obtaining a RIPDES permit is not required for the completion of this work.

10.4 EARTH MOVING OPERATIONS

All excavation, grading, and earth-moving operation will be conducted in accordance with the Stormwater Pollution Prevention Plan prepared by the remediation subcontractor. Wetlands and wetland buffer zones are delineated as depicted on Figure 1-1. Construction activities in the wetlands and buffer zones will be conducted in accordance with RIDEM regulations and USACE Section 10 and 404 requirements.

10.5 COASTAL ZONE CONSISTENCY DETERMINATION

A coastal zone consistency determination from the Rhode Island CRMC, which will be included as an appendix in the final work plan, is required for the shoreline excavation and wetland replacement activities. All activities will be required to be consistent to the maximum extent practicable with the requirements of the Rhode Island Coastal Resources Management Program. Also, the USACE will authorize the shoreline dredging contingent upon receipt of the consistency determination from the CRMC. The Navy is responsible for submitting a coastal zone consistency determination to the CRMC for review at least 60 days prior to the desired start date of site work.

10.6 AIR POLLUTION CONTROL

10.6.1 Fugitive Dust and Odor Emissions

Fugitive dust and/or odor emissions may occur during the excavation operations. Consequently, engineering controls will be used to control these emissions. The controls will include keeping surfaces adequately wet during intrusive activities and covering stockpiles and materials being transported. It is anticipated that petroleum odors may be generated during excavation of oily soils. Air monitoring will be performed in accordance with the site-specific HASP to monitor dust and VOC levels.

10.7 WASTE MANAGEMENT

All excavated materials designated for off-site disposal will be disposed in accordance with the RIDEM Solid and Hazardous Waste Regulations. As wastes are excavated, they will be field-screened as described in Section 5.0 and segregated based on the screening results. Similar wastes will be stockpiled together, sampled, and analyzed to determine the appropriate waste classification. Waste materials potentially not suitable for stockpiling include liquid wastes and drums containing liquid. Groundwater encountered during the excavation activities will not be considered liquid waste.

The following waste materials will be generated during remedial activities:

- Construction debris and industrial wastes containing oily and petroleum wastes
- Potentially contaminated vegetative waste generated during site clearing activities
- Uncontaminated above-grade vegetative waste generated during site clearing activities
- Subsurface structures
- PPE consisting of Tyvek, booties, gloves, etc. from intrusive activities in the EZ
- Decontamination solids and liquids

All disposal facilities and transporters involved with off-site disposal will be approved by the Navy in advance. The remediation subcontractor will prepare all necessary waste documentation (profiles, bills of lading, hazardous waste manifests) for Navy review and signature. TtNUS and subcontractor personnel will not sign any waste documentation without written authorization of the Navy and approval.

10.7.1 Excavated Wastes

Excavated wastes will be cast into 10 cubic yards piles based on visual observation, field-screened as described in Section 5.0, and stockpiled with similar wastes pending waste classification sampling and analysis. Wastes found to be characteristically hazardous as defined by RCRA will be disposed of at an out-of-state RCRA-permitted hazardous waste facility. Non-hazardous wastes will be either reused on-site or landfilled at a non-hazardous solid waste landfill located nearby.

10.7.2 Construction and Demolition Debris

Construction and demolition debris consisting of wood, concrete, metal and other materials will be generated during excavation activities. This debris will be broken, as necessary, into manageable pieces and stockpiled for waste classification sampling and disposal. Off-site recycling of debris may be considered a more cost-effective option if the cost to separate, decontaminate as needed, and handle the

debris does not outweigh the cost difference for landfill disposal as commingled waste. Sampling and analysis of any waste material will be conducted as necessary in accordance with this work plan.

10.7.3 Uncontaminated Vegetative Waste

Uncontaminated vegetative waste generated from surficial clearing activities will be chipped on-site and stockpiled during the project activities. The material will be spread over the backfilled site upon completion of the work.

10.7.4 Potentially Contaminated Vegetative Waste

Potentially contaminated vegetative waste generated from below-grade grubbing operations in potentially contaminated areas will be chipped on-site and stockpiled with other site wastes pending waste classification sampling and off-site disposal.

10.7.5 Personal Protective Equipment

PPE (Tyvek, gloves, booties, etc.) generated in the EZ during intrusive work will be placed in roll-off containers and sampled for waste characterization analyses. Non-hazardous PPE will be disposed off-site at a RCRA-permitted Subtitle D solid waste landfill. Hazardous PPE will be disposed at a RCRA-permitted Subtitle C hazardous waste facility. PPE sampling will be conducted in accordance with this work plan. PPE generated during clean work activities will be considered clean and disposed off-site as non-hazardous solid waste at a RCRA-permitted Subtitle D solid waste landfill.

10.7.6 Decontamination Solids

Decontamination solids generated from decontamination of equipment previously in contact with site wastes will be field-screened for organic vapors, stockpiled with similar wastes pending waste characterization sampling and analysis, and ultimately disposed off-site in either a RCRA-permitted Subtitle D solid waste facility or Subtitle C hazardous waste facility.

10.7.7 Liquid Wastes

Potential sources of liquid waste on-site include decontamination water, surface water, and subsurface water removed from excavations during dewatering. Decontamination water generated from in-place decontamination of equipment will be allowed to flow onto yet-to-be-remediated sections of the site. Surface and subsurface water that collects in areas of the site and requires pumping will be containerized

and characterized in accordance with the selected off-site disposal facility's requirements. Collected water that does not require pumping will be allowed to the settle into the site soil.

10.7.8 RCRA Waste Classification

Materials will be classified as RCRA waste (40 CFR 261.11) if they are (1) a listed waste under 40 CFR 261.31, .32, and .33, or (2) characteristic for ignitability (D001), corrosivity (D002), reactivity (D003), or toxicity (D004-D043) as defined in 40 CFR 261.21, .22, .23, and .24. Materials will be field-screened for organic vapors and stockpiled pending full waste characterization sampling. Waste analysis will occur at the frequency specified in this work plan. Some soils have previously been characterized by TtNUS; therefore, disposal facilities may be pre-selected by the remediation subcontractor.

10.7.9 Solid Waste Classification

Solid wastes are those materials defined by 40 CFR 262.1 as drilling wastes, garbage, refuse, sludge, and other discarded materials including solid, liquid, semi-solid, or contained gaseous material generated by industrial, commercial, or agricultural operations or from community activities. Site-generated solid wastes that exhibit no RCRA characteristics will be regulated as non-hazardous and disposed of in a RCRA-permitted Subtitle D solid waste facility. All Subtitle D solid waste facilities used for off-site disposal will be first reviewed by the Navy and subject to Navy approval.

10.7.10 Permitting and Approval Requirements

The remediation subcontractor will be responsible for obtaining approval for disposal from the off-site facilities. The Navy is responsible for obtaining RCRA Notification of Hazardous Waste Activity forms and a Generator's Hazardous Waste Number.

10.7.11 Waste Minimization

Waste minimization principles will be incorporated into the project as follows:

- All planning activities will incorporate waste minimization practices.
- Waste streams will be segregated.
- Materials will be reused/recycled where possible.
- Use of hazardous materials will be minimized.
- Materials will not be contaminated unnecessarily.
- Equipment will be decontaminated and reused when practical.

- Hazardous materials will be subject to strict inventory controls.
- Using dedicated equipment, minimal amounts of environmental media will be generated to minimize decontamination requirements and waste volumes.

Each of the above steps will reduce the amount of contaminated waste generated during the project. Site inspections will be conducted by the TtNUS construction management team to monitor site compliance and waste minimization activities.

10.7.12 Segregation/Screening

Waste will be segregated based on existing information including the waste location, potential chemical composition, appearance, odor, and field monitoring results. Similar wastes will be consolidated together for waste characterization sampling. Non-hazardous waste will be segregated from hazardous waste whenever possible. Waste segregation practices are intended to facilitate waste classification, maximize reuse, minimize treatment and disposal costs, and match the acceptance criteria of off-disposal facilities.

10.7.13 Containerization

Characterized wastes designated for off-site disposal will be placed in DOT-compliant containers. Bulk and non-bulk containers will be used based on waste volumes. Lined dump trailers and roll-off containers will be used for large volumes of waste including soil, debris, and PPE wastes. Contaminated water generated during dewatering activities will be containerized in a 20,000-gallon frac tanks. Smaller volumes of waste such as decontamination water will be stored in non-bulk containers pending off-site disposal. DOT-specified 1A1 (closed top) and 1A2 (open top) steel drums will be suitable for non-bulk waste streams such as non-decontamination water.

10.7.14 Storage

All stockpiles, containers, and portable tanks will be located at the temporary staging area. This location will be approved by the Navy and RIDEM and used to store all hazardous and non-hazardous wastes generated by project activities. Upon receiving test results, the construction management team will seek Navy approval for off-site transportation and disposal if necessary. Hazardous waste will be stored on-site for less than 90 days from the date of generation unless a generator storage limit extension is obtained. The remediation subcontractor will complete any necessary forms to request extensions and submit the forms to the Navy for review and signature.

The Project Superintendent is responsible for identifying the emergency coordinator for the waste accumulation/storage area. The emergency coordinator is responsible for coordinating any emergency response activities related to waste storage area spills or releases. The following information will be posted at the waste accumulation area at all times:

- Name and telephone number of emergency coordinator
- Location of fire extinguisher and spill control materials
- Telephone number of fire department
- Signage stating “Authorized Personnel Only”

10.7.15 Container Inspections

Waste container accumulation areas will be inspected weekly by project personnel while the work is in progress to ensure proper labeling and secure closure and assess the condition of each container, the number of containers, and the condition of the storage area. Any signs of deterioration, leaking, or dents will be noted and the containers will be immediately overpacked, if necessary. Inspection results will be documented in writing and the date and time of inspection and the inspector’s signature will be provided on each inspection log.

10.7.16 Container Marking and Labeling

At the time of generation, all waste containers will be marked in indelible ink, paint, or grease pencil with the following information:

- Source and location
- Contents of the container (type of material and expected hazards)
- Accumulation start date (the date material was first put in the container)
- Date container was sampled
- Special handling instructions
- “Hazardous Waste” label (for known or suspected hazardous waste)

Upon receipt of analytical results, containers will be immediately labeled with commercially available labels. Within 5 days of receiving analytical results, project personnel will contact the Navy if the waste is determined to not be hazardous. After concurrence from the Navy, the hazardous waste label will be removed and the container will then be relabeled with a “Non-Hazardous Waste” label. Based on final classification, the remediation subcontractor will select a proper DOT shipping name for any material meeting a DOT hazard class. The remediation subcontractor will direct application of any required DOT

markings and labels specific to the proper shipping name. The remediation subcontractor will also specify required placarding based on the proper shipping name selected. Completion of the EPA Hazardous Waste Label will meet the DOT requirements for cosignor/cosignee, name, address, and contents.

10.7.17 Sampling and Waste Classification

A full sampling and analysis program will be provided in the CQC Plan. The classification of each waste stream will be based on legally defensible analytical results from the waste characterization sampling. The remediation subcontractor will submit the documentation supporting each waste stream classification to the Navy. The Navy will be responsible for approving all waste classifications.

10.7.18 Spill Prevention Procedures

The remediation subcontractor will take all necessary precautions to prevent the possible release of contaminants to the environment during all phases of the Removal Action. In the event of a spill, the remediation subcontractor will perform the following at a minimum:

- Immediately notify the Navy.
- Address and adhere to federal and state requirements for reportable spills.
- Take immediate measures, utilizing properly protected personnel, to control and contain the spill.
- Isolate the hazardous area and keep all unnecessary personnel out of the area.
- Stay upwind and out of low areas.
- Keep combustibles away from the spill materials.
- Use water spray or other approved methods to reduce vapors, gases, and/or dust emissions.

10.7.19 Manifest Packages

Both hazardous and non-hazardous waste will potentially be generated during this project. The EPA-approved Uniform Hazardous Waste Manifest will be used, and any additional requirements imposed by the waste-receiving state(s) will be observed. Non-hazardous waste will be shipped with a bill of lading or non-hazardous waste manifest. The principal components of the completed manifest packages submitted to the Navy may include:

- Hazardous waste manifests
- Hazardous material shipping papers
- Waste profile sheets

Supporting information will include:

- Waste disposal history
- Analytical results
- Material Safety Data Sheets
- Information reviewed in identifying the proper waste code
- DOT-specified waste packaging, labeling, marking, manifesting, and placard requirements

10.7.20 Manifest Package Preparation and Submittal

The remediation subcontractor will prepare the complete manifest package including waste characterization, waste profiles/approvals, and manifests/bills of lading.

The TtNUS construction manager will submit to the Navy for review and signature a reproducible copy of the complete manifest package for each individual waste stream as soon as possible after waste classification and disposal facility approvals have been obtained. The Navy will be responsible for signing all hazardous waste manifests and bills of lading for off-site waste shipments. The construction manager will hold the original complete manifest package and make corrections based on Navy comments, prior to off-site shipment.

Within 24 hours of obtaining a transporter signature and shipping waste materials off-site, the construction manager will provide the Navy with two copies of the manifest (signed by the generator and original transporter) and the remainder of the approved complete manifest package.

No waste will be transported prior to obtaining Navy approval of the complete manifest package and Navy signatures for the manifests and shipping documents. The remediation subcontractor will not sign waste profiles or manifest packages without written authorization from the Navy and approval of internal legal counsel.

10.7.21 Manifest Reporting Requirements

The TtNUS construction manager will provide the Navy with all generator copies of signed manifests. Under RIDEM regulations, two copies of every manifest must be sent to the RIDEM; one from the Navy and one from the Treatment, Storage, and Disposal Facility (TSDF) after the TSDF has signed the manifest. The Navy is also responsible for sending a generator's copy of the manifest to the receiving state, if not Rhode Island, if the receiving state requires a generator's copy.

10.7.22 Record-Keeping Requirements

Records will be kept for all activities. Records to be retained include all hazardous waste manifests, Generator Biennial Reports, manifest exception reports, bills of lading, records of any test results or waste analyses, waste profile sheets, and meeting notes and minutes, etc.; records will be retained for at least three years after project completion. The TtNUS construction manager will retain photocopies of all waste documentation in the project file and will forward original copies of all manifests and bills of lading to the Navy.

10.7.23 Exception Reports

If, by the 35th day after the transporter signs the manifest, the Navy has not received a signed copy of the signed manifest from the TSDF, the remediation subcontractor will contact the TSDF by telephone to obtain a signed copy. If the Navy has not received a signed copy of the manifest by the 38th day, an exception report will be prepared. This exception report will be submitted to the Navy for review and approval no later than day 40. The remediation subcontractor will document all calls to locate shipments and submit the documentation with the exception report. The Navy will submit the signed exception report to the EPA Regional Administrator prior to the 45th day. All exception reports will also be presented in the Closure Report.

10.8 DOT HAZARDOUS MATERIAL TRANSPORTATION

All waste materials destined for off-site disposal are expected to be non-hazardous and will not meet the definition of a DOT hazardous material, however, in the event that hazardous materials are encountered, the remediation subcontractor will adhere to the applicable requirements for waste and sample shipment. Hazardous materials will be properly classed, described, packaged, marked, labeled and conditioned for shipment as required by 49 CFR 171.

Waste that does not exhibit any of the nine DOT hazard class characteristics (i.e., explosive, flammable, poisonous, combustible, etc.) is not regulated under DOT specifications for transportation of hazardous material. If waste is suspected to be hazardous, then it will be shipped under the suspected hazard class. If a particular hazard class is unable to be determined, then the material may be shipped under either of the following:

Shipping Name	Hazard Class	ID Number	Packing Group	Label
Environmentally hazardous substances, liquid, n.o.s.	9	UN3082	III	CLASS 9
Environmentally hazardous substances, solid, n.o.s.	9	UN3077	III	CLASS 10

When using either one of these “n.o.s.” (not otherwise specified) shipping names, at least two technical names must follow (i.e., “Environmentally hazardous substances, liquid, n.o.s. [Benzene and Acetone]”).

The shipping name, identification number, packing group, instructions, cautions, weights, EPA waste code numbers, and cosignee/cosignor designations will be marked on the packages for shipment. The label will provide information regarding the DOT hazard class.

The label to be placed on the material will depend on the results of the sampling. Once the waste is characterized, reference should be made to the Hazardous Materials Table in 49 CFR 172.101 to determine the appropriate label. The package (or drum) will be marked and labeled as specified in 49 CFR 172.301.

The person presenting hazardous material for shipment will offer placards (49 CFR 172.506). Any quantity of material listed in Table 1 of the regulations will be placarded. However, if there is less than 1,000 pounds of a Table 2-listed material, no placard is required. Class 9 placards are not required for domestic shipments. If a placard is required, the label referenced above will be affixed on each side and end of the vehicle.

Hazardous material shipment papers will include the following information about the material, in the following order:

- Proper shipping name;
- Hazard class or division;
- Identification number;
- Packaging group;
- Total quantity (listed either before or after the above information); and
- Technical and chemical group names, which may be entered in parentheses between the proper shipping name and hazard class or following the basic description (e.g., “Flammable liquids, n.o.s. [contains xylene and benzene], 3 UN1993, PG II’).

Other required information includes:

- EPA identification (applicable to manifests);
- Emergency Response Guidebook numbers;
- 24-hour emergency response number, supplied by the generator;
- Signatures; and
- Shipper's certification.

All remediation subcontractor and other personnel involved in DOT Hazardous Material Shipment activities will have been trained in accordance with personnel training requirements outlined in 49 CFR 172 Subpart H.

10.8.1 Waste Transporter Selection

To ensure safe transport of the waste, only transporters who have demonstrated competence and hold the required license and permits for transporting will be used. Remediation subcontractor policies and procedures for subcontracting will be followed. Transporter EPA/state identification numbers will be kept in project and compliance files. Trucks will be tightly covered to prevent fugitive releases of material during transport.

11.0 REPORT

Upon completion of the work, TtNUS will prepare and submit a Closure Report to document that the Removal Action was conducted based on the requirements of the Action Memorandum. A Closure Report to document installation of the revetment will be submitted separately.

The report will contain a description of the Removal Action including the total volume of waste disposed off-site and disposal volume of each classification of waste material, the total volume of soil reused as backfill on-site, a summary of field screening activities, confirmation sampling and waste characterization analytical results, field QC inspection reports, weekly progress reports, manifest records for all material shipped and disposed off-site, photographic documentation of the project work, the date of the final site walkover, the final cost, and statement from the Navy indicating that the work is acceptable. Maps will be included showing dimensions of removal areas, depths excavated as well as a description of materials and structures left in place. The report will also contain a signed statement from the Professional Engineer in charge of the project to certify that the work has been completed in accordance with the applicable regulations and policies. The Closure Report will be submitted as Draft for Navy review within 60 days of completing the site work.

The Closure Report will be provided as a draft for EPA and RIDEM review and comment, and then will be revised (as needed) as final.

FIGURES

NOTES:

1. BASE MAP FROM A PLAN BY LOUIS FEDERICI & ASSOCIATES, PROVIDENCE, RI, PLS STAMP DATED: 06/10/05, ENTITLED: "SURFACE WARFARE OFFICERS SCHOOL (SWOS) SITE, 2005 – TOPOGRAPHIC SURVEY, SOIL BORINGS, MONITORING WELLS AND FEATURE LOCATION AT THE OLD FIRE FIGHTING TRAINING AREA, NEWPORT NAVAL BASE, IN NEWPORT, RHODE ISLAND FOR TETRA TECH NUS, INC.", ORIGINAL SCALE: 1"=50 FT., PLAN DATUM HORIZONTAL: NAD 83 (FEET), VERTICAL: NAVAL BASE MEAN LOW WATER.

2. TPH GRADIENT LEVELS DIGITIZED FROM FIGURE CREATED BY A KRIGING INTERPOLATION MODEL THROUGH ARCVIEW / EGIS USING DATA COLLECTED BETWEEN 2003 AND 2005; KRIGING SLICE IS AT 2 FT. ELEVATIONS (NAVAL BASE MEAN LOW WATER)

3. ALL LOCATIONS ARE TO BE CONSIDERED APPROXIMATE.

4. PLAN NOT TO BE USED FOR DESIGN.

5. TEN TEST PIT LOCATIONS ARE TO BE DETERMINED BY THE RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT, AND ARE THEREFORE NOT SHOWN.

GRAPHIC SCALE

0′ 120′ 240′

SITE MAP: EXISTING CONDITIONS

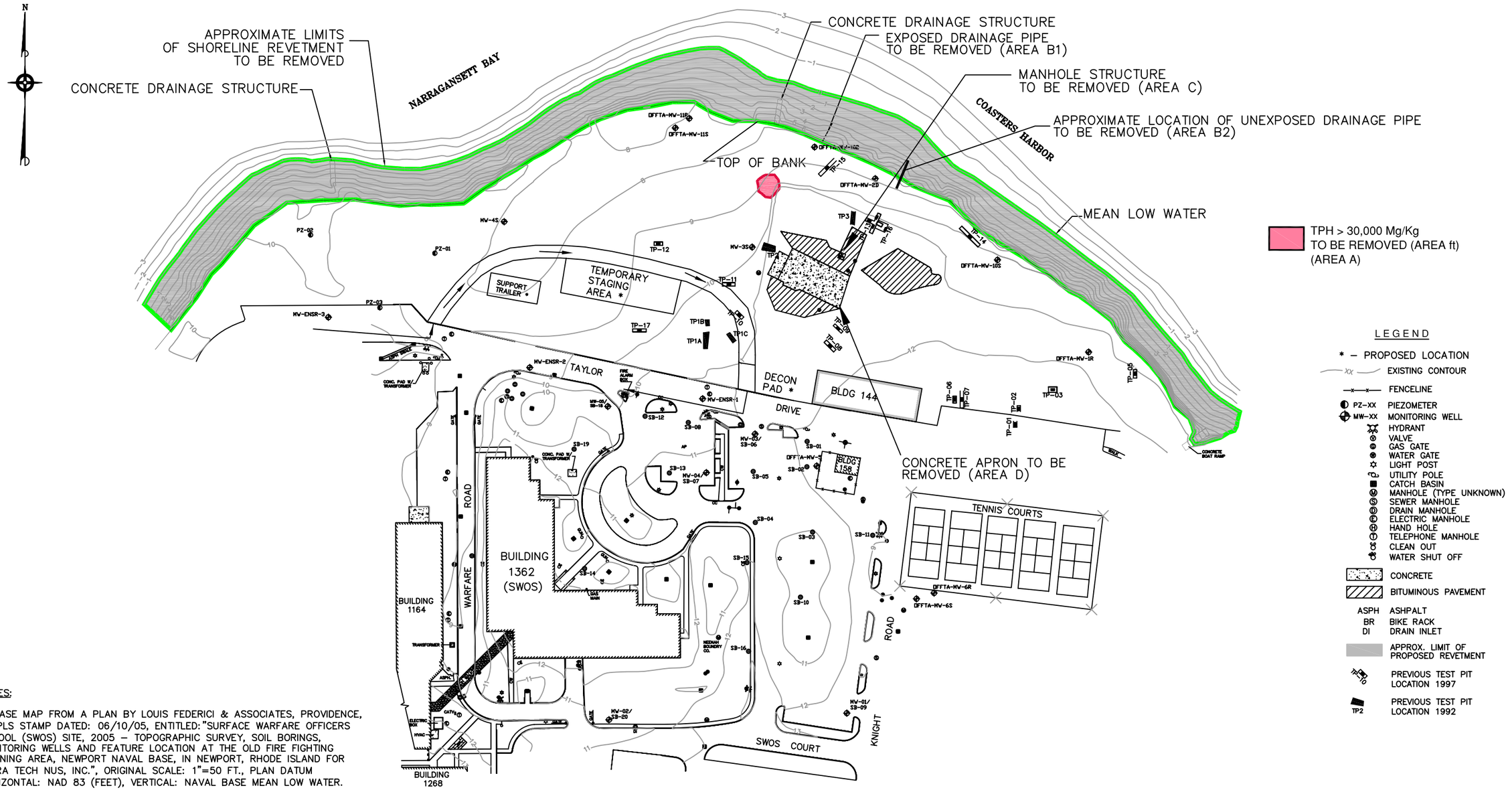
SITE 09 – OLD FIRE FIGHTING AREA

NAVSTA NEWPORT – NEWPORT, RHODE ISLAND

DRAWN BY:	D.W. MACDOUGALL	REV.:	0
CHECKED BY:	S. PARKER	DATE:	AUGUST 30, 2007
SCALE:	AS NOTED	FILE NO.:	\00632\0210\FIG_1-1A.DWG

FIGURE 1–1

TETRA TECH NUS, INC.
55 Jonspin Road Wilmington, MA 01887
(978)658–7899



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3. ALL LOCATIONS ARE TO BE CONSIDERED APPROXIMATE.

4. PLAN NOT TO BE USED FOR DESIGN.

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GRAPHIC SCALE

0′ 120′ 240′

SITE MAP: PROJECT WORK AREAS

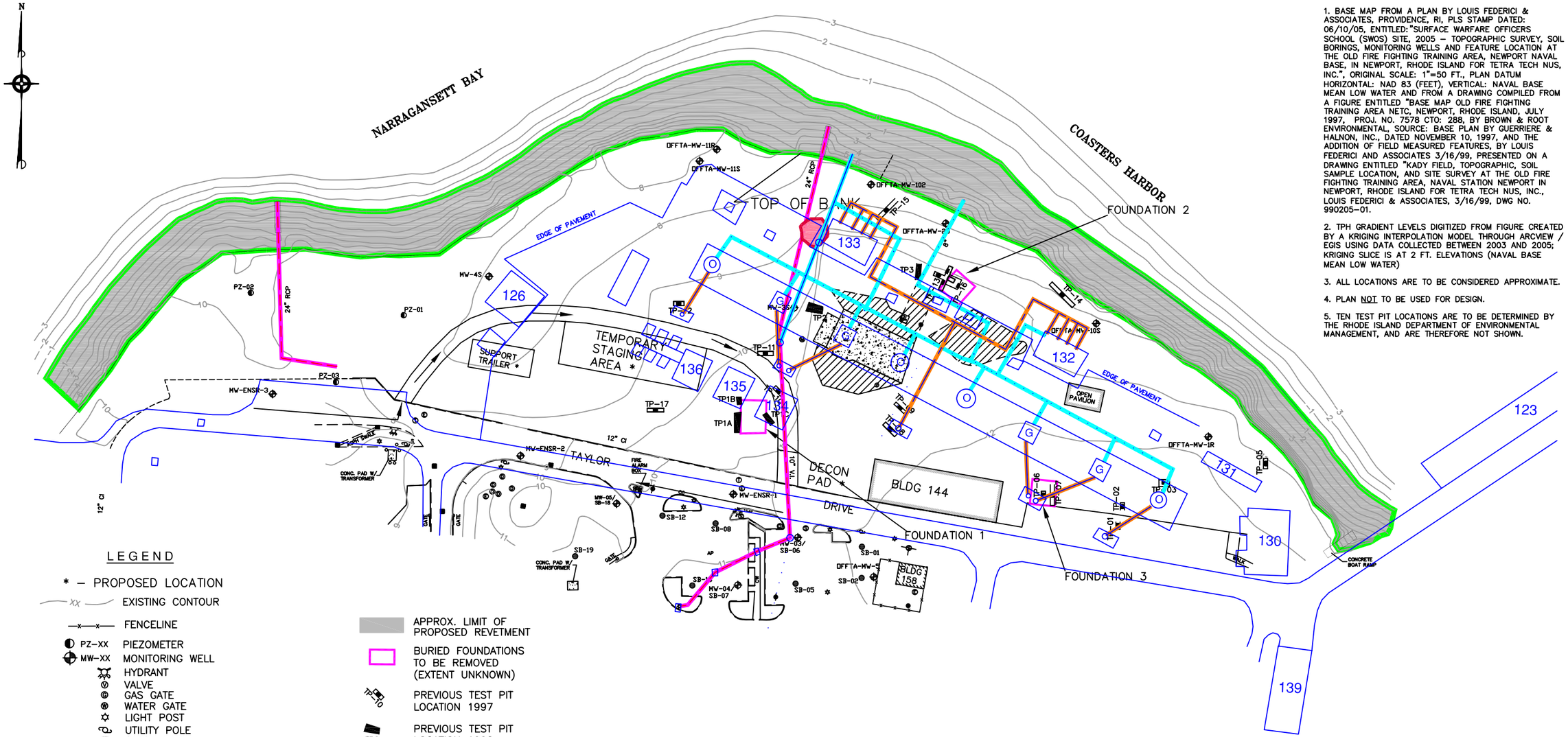
SITE 09 – OLD FIRE FIGHTING AREA

NAVSTA NEWPORT – NEWPORT, RHODE ISLAND

DRAWN BY:	D.W. MACDOUGALL	REV.:	0
CHECKED BY:	S. PARKER	DATE:	AUGUST 30, 2007
SCALE:	AS NOTED	FILE NO.:	\00632\0210\FIG_1-2A.DWG

FIGURE 1-2

TETRA TECH NUS, INC.
55 Jonspin Road Wilmington, MA 01887
(978)658-7899



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2. TPH GRADIENT LEVELS DIGITIZED FROM FIGURE CREATED BY A KRIGING INTERPOLATION MODEL THROUGH ARCVIEW / EGIS USING DATA COLLECTED BETWEEN 2003 AND 2005; KRIGING SLICE IS AT 2 FT. ELEVATIONS (NAVAL BASE MEAN LOW WATER)

3. ALL LOCATIONS ARE TO BE CONSIDERED APPROXIMATE.

4. PLAN NOT TO BE USED FOR DESIGN.

5. TEN TEST PIT LOCATIONS ARE TO BE DETERMINED BY THE RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT, AND ARE THEREFORE NOT SHOWN.

LEGEND

* – PROPOSED LOCATION
XX EXISTING CONTOUR
FENCELINE
PZ-XX PIEZOMETER
MW-XX MONITORING WELL
HYDRANT
VALVE
GAS GATE
WATER GATE
LIGHT POST
UTILITY POLE
CATCH BASIN
MANHOLE (TYPE UNKNOWN)
SEWER MANHOLE
DRAIN MANHOLE
ELECTRIC MANHOLE
HAND HOLE
TELEPHONE MANHOLE
CLEAN OUT
WATER SHUT OFF
CONCRETE
BITUMINOUS PAVEMENT
ASPH ASHPALT
BR BIKE RACK
DI DRAIN INLET

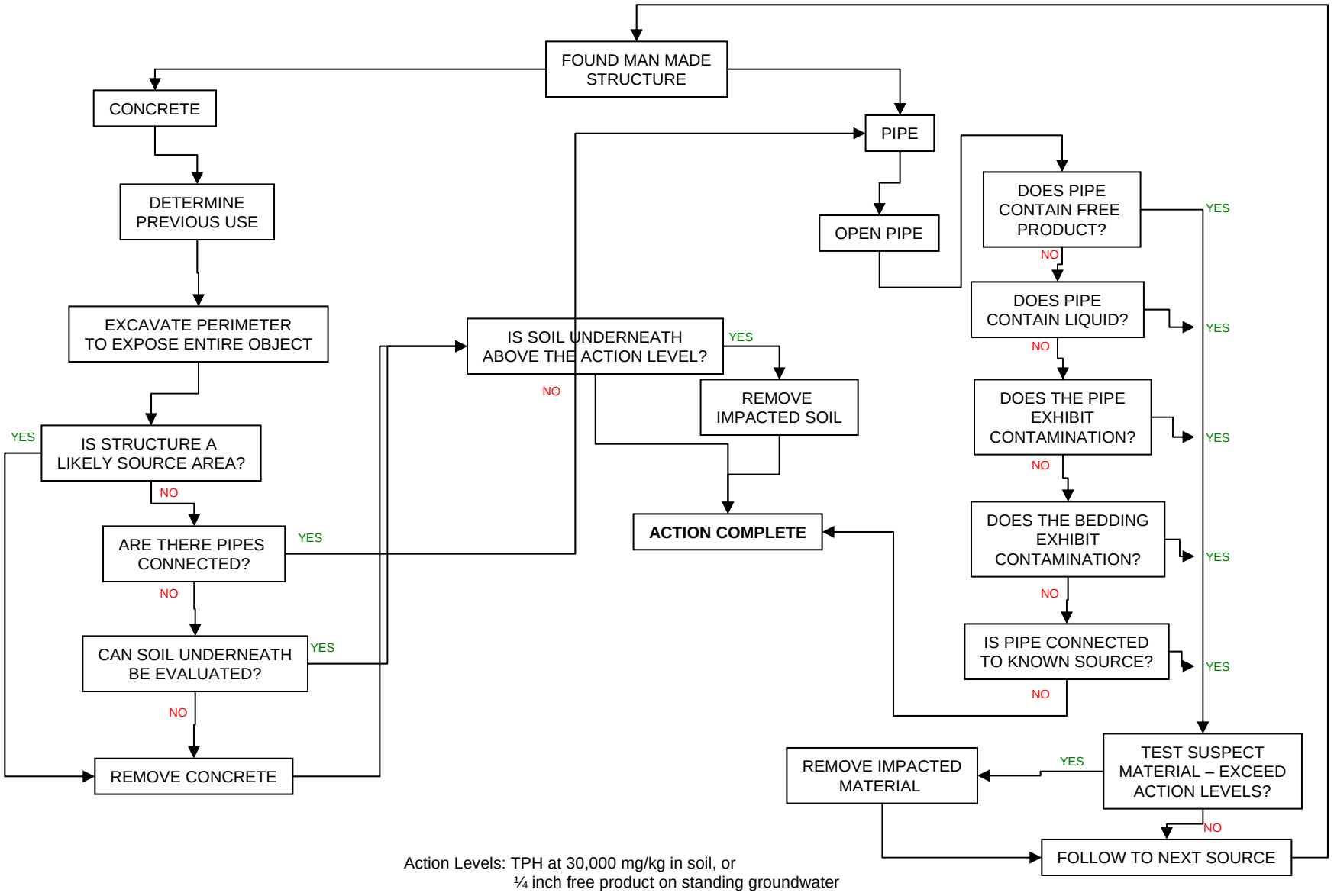
APPROX. LIMIT OF PROPOSED REVETMENT
BURIED FOUNDATIONS TO BE REMOVED (EXTENT UNKNOWN)
PREVIOUS TEST PIT LOCATION 1997
TP2 PREVIOUS TEST PIT LOCATION 1992
TPH > 30,000 Mg/Kg TO BE REMOVED (AREA ft)
135 BUILDING AND BUILDING ID
STORM AND COMBINED SEWER (HISTORIC)
OIL LINE (HISTORIC)
OIL TANKS
GAS TANKS (X-MAS TREES)
EXISTING MAJOR STORM SEWER LINE

GRAPHIC SCALE
0' 100' 200'

SITE MAP: PROJECT WORK AREAS AND HISTORICAL FEATURES			FIGURE 1-3
SITE 09 – OLD FIRE FIGHTING AREA			
NAVSTA NEWPORT – NEWPORT, RHODE ISLAND			
DRAWN BY:	D.W. MACDOUGALL	REV.:	0
CHECKED BY:	J. FORRELLI	DATE:	MAY 22, 2007
SCALE:	AS NOTED	FILE NO.:	\00632\0210\FIG_1-3A.DWG

TETRA TECH NUS, INC.
55 Jonspin Road Wilmington, MA 01887
(978)658-7899

FIGURE 5-1
Excavation Decision Tree
Removal Action Work Plan for Old Fire Fighting Training Area
NAVSTA Newport, Newport, Rhode Island



Action Levels: TPH at 30,000 mg/kg in soil, or
¼ inch free product on standing groundwater

APPENDIX A

ACTION MEMORANDUM FOR NTCRA JANUARY 15, 2007

ACTION MEMORANDUM

DATE: January 15, 2007

FROM: Captain Todd W. Malloy, Commanding Officer Naval Station Newport

SUBJECT: Non-Time Critical Removal Action
Old Fire Fighting Training Area (Site 09)
Naval Station Newport, Newport, Rhode Island

1. PURPOSE

The purpose of this Action Memorandum is to document the decision by the U.S. Navy (Navy) to conduct a non time critical removal action (NTCRA) to remove contaminated subsurface soil and subsurface structures, and to replace the shoreline protection system at the Old Fire Fighting Training Area (OFFTA) Site, at Naval Station (NAVSTA) Newport, in Newport Rhode Island.

This action is to be taken to reduce potential risks to the public health, welfare and the environment posed by contaminants in the soils resulting from former use as a fire training area. Contaminated subsurface soil, building foundations, drain lines, and a suspected oil-water separator at OFFTA will be removed in this action. The existing shoreline protection material will be replaced with an engineered stone revetment to prevent further erosion of soil into Coasters Harbor.

This NTCRA is being conducted by the Navy under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Rhode Island Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (Remediation Regulations).

2. NAVSTA NEWPORT BACKGROUND

The NAVSTA Newport facility has been in use by the Navy since the era of the Civil War. During World Wars I and II, military activities at the facility increased significantly and the base provided housing and support for many servicemen. In subsequent peacetime years, use of on-site facilities was slowly phased out until Newport became the headquarters of the Commander Cruiser-Destroyer Force Atlantic in 1962. In April 1973, the Shore Establishment Realignment Program (SER) resulted in the reorganization of naval forces, and activity again declined. From 1974 to the present, research and development and training have been the primary activities at Newport. The base was renamed from the Naval Education and Training Center (NETC) to Naval Station Newport in 1998. The major commands currently located at NAVSTA Newport include the Naval Education and Training Center, Surface Warfare Officers School Command, Naval Undersea Warfare Center, and the Naval War College. Occupying approximately 1,063 acres, NAVSTA Newport is located along the western shoreline of Aquidneck Island for approximately 6 miles facing the east passage of Narragansett Bay. Portions of the facility are located in the City of Newport and the Towns of Middletown, Portsmouth, and Jamestown, Rhode Island.

3. SITE DESCRIPTION

This section presents an assessment of the environmental conditions at the OFFTA site. The site conditions have been evaluated through performance of a Source Removal Investigation (1997) a Remedial Investigation (RI) (2001), a Feasibility Study (FS) (2002) and Pre-Design Investigation Studies (2002 and 2004).

a. Background. The OFFTA Site is located at the northern end of Coasters Harbor Island (see Figure 1), which is part of NAVSTA Newport. Coaster Harbor Island has a land area of 92 acres. Navy training facilities, including the Naval War College, occupy the portion of the island south of the OFFTA Site. The Site occupies approximately 5.5 acres and is bordered by Taylor Drive to the south and is surrounded by Coasters Harbor (part of Narragansett Bay) to the east, north, and west. Located along Taylor Drive, opposite the Site, are instructional facilities and asphalt parking lots. A small portion of

the parking area for the Surface Warfare Officers School was determined to be part of the Site due to the presence of oil contamination that appears to be contiguous to that present at OFFTA.

The OFFTA Site is generally flat, with base grade surface elevations ranging from 8 to 12 feet above mean low water (MLW). Until recently, the most prominent topographic features of the site were three mounds constructed into the landscape, with heights ranging from 4 to 20 feet above the surrounding area. These mounds, which contained contaminated soil and debris, were removed in a NTCRA conducted by the Navy from September 2004 through March 2005. The Site surface is predominantly soil and mown grass. A temporary gravel parking lot is located in the center portion of the site formerly occupied by a baseball field. A one-story concrete block building (Building 144), currently used for recruiting offices, is located along the southern side of the Site. With the exception of the parking areas, use of the OFFTA Site is not allowed; access to the Site is restricted by a chain link fence along its eastern, southern, and western sides.

The site is underlain by layers of fill, consisting of construction debris and sand and gravel; silty sand and gravel; peat; silt; and glacial till consisting of silt, sand and gravel. Overburden deposit thickness ranges from about 6 to more than 25 feet.

Groundwater is present between four and eight feet below ground surface. Groundwater elevation is influenced by tidal fluctuation, particularly near the shoreline. The groundwater beneath the site is classified by RIDEM as GB (not a potential current or future drinking water source).

A Navy fire fighting training facility occupied the Site from World War II until 1972. During the fire training operations, sailors ignited fuel oils in small structures at the site that simulated shipboard compartments, and then extinguished the fires. Figure 2 depicts the site and site features during the fire fighting training. These operations resulted in releases of fuel mixtures to the ground at the site. Upon closure of the fire fighting training facility, the training structures were reportedly demolished and the debris was buried in the mounds on the site, and then the entire area was covered with 1 to 2 feet of topsoil. The site was converted to a recreational area (Katy Field) in 1976 and used as such until its closure in 1998.

Currently the site is unused, with the exception of Building 144, occupied by recruiting offices. A replacement bridge is anticipated to be constructed to connect Taylor Drive to Coddington Point, and the associated project will impact approximately one acre on the easternmost portion of the site.

b. Removal Site Evaluation.

Extensive investigations have been conducted at the site including Remedial Investigation, Feasibility Study and Pre-design Investigations. This section summarizes the findings of these investigations.

Results indicate that past site activities have resulted in the release of both organic and inorganic contaminants. Contaminants that are believed to be site related include petroleum hydrocarbons, polycyclic aromatic hydrocarbon (PAH) compounds, and lead. Other contaminants found that are not believed to be site related include the metals antimony, arsenic, beryllium and manganese, and the pesticide dieldrin. In addition to the contaminated soil at the site, various types of debris, including concrete debris and intact foundations, bricks, asphalt, and remnant piping are present in the subsurface and along the shoreline.

Residual petroleum was observed in various locations, as oily soils bound within vadose zone soils and as a petroleum sheen on groundwater generated during excavation of test pits. The highest concentrations of petroleum exceed 30,000 mg/kg in soil which constitutes an exceedance of an upper concentration limit, in accordance with RIDEM Remediation Regulations (August 2004). Other soils near Coasters Harbor contain concentrations of TPH between 500 mg/kg and 10,000 mg/kg (refer to Figure 3).

PAHs were detected at their highest concentrations in subsurface soil and groundwater sample locations adjacent to Coasters Harbor. PAHs were also detected in shoreline sediment (intertidal), marine sediment (subtidal), and storm water samples. The highest concentrations of PAHs in marine sediment were detected at sampling stations nearest the shore in the vicinity of storm drain outfalls discharging at the shoreline of the site. Asphalt is present on the shoreline as debris and the shoreline shows signs of erosion in the western portion of the site. Concentrations of PAHs range from non-detect to over 90 mg/kg of total PAH in soil.

Metals were detected in soils and debris throughout the site. The presence of lead contamination in the site soil and fill possibly resulted from residual lead paint or leaded fuels used at the site. An average concentration of lead in fill at the site is calculated to be 888 mg/kg with a maximum concentration of 8250 mg/kg in fill (TtNUS 2004). Other metals of concern (including antimony, arsenic, beryllium and manganese were found at comparable or higher concentrations in till at the site and tended to be present at higher concentrations in deeper soils, indicating that they are naturally occurring (TtNUS 2004).

In 2004, a manhole was uncovered under the central mound at the site. Upon research into the former structures at the site, it was determined that this manhole is likely part of the former drainage system and may be connected to a former oil water separator.

c. Release or Threatened Release into the Environment of a Hazardous Substance, or Pollutant or Contaminant. The on-shore portion of the site contains an estimated 450 cubic yards of soil contaminated with petroleum in excess of 30,000 mg/kg, which exceeds RIDEM upper concentration limits for petroleum. In addition, wave erosion of the rubble shoreline protection material and the soil behind it may contribute to sediment contamination in Coasters Harbor. Finally, structures including a suspected oil-water separator, a former discharge pipe and three former building foundations were previously found at the site that may provide inputs as continuing sources of contamination.

d. National Priorities List (NPL) Status. On November 21, 1989, NETC Newport was added to the National Priorities List (NPL) (54 FR 48184). On March 23, 1992 Site 09 (Fire Fighting Training Area) was recognized as an "Area of Contamination" (AOC) by the signing parties to the Federal Facilities Agreement (FFA) for NETC Newport. Therefore the Navy is required to take response actions pursuant to CERCLA and the terms of the agreement. Although NETC Newport has undergone change of name to NAVSTA Newport, NPL status is not affected.

4. OTHER ACTIONS TO DATE

a. Previous Actions. In 1998 the Navy conducted a removal evaluation at the OFFTA site to determine if there were still vessels or piping in place in the subsurface that could be contributing to the contamination at the site. Although remnant piping was found in the soils, these pipes were not connected and it was concluded that the fuel storage facilities had been removed during the redevelopment effort in the 1970s and no significant source of contamination remained in the subsurface soils that would warrant a source removal at that time. Areas under the debris mounds were not evaluated at that time due to the obstructions that the mounds posed.

In November and December 2003, the Navy conducted a Soil Pre-Design Investigation, which involved collection of additional subsurface information to better delineate the extent of contaminants in the mounds and subsurface soils on the OFFTA site. From this investigation, two reports were prepared: (1) the Mound Summary Report (March 2004) was prepared to help define the volume of soil and debris in the mounds requiring removal during the first removal action and (2) the Soil Pre-Design Investigation Report (April 2005) was prepared to help define the volume of soil and fill requiring removal under a second possible removal action for the on-shore portion of the OFFTA site.

The mound removal action was completed by the Navy at the OFFTA site in March 2005. Removal of the mounds was required to 1) confirm that no concentrated contaminant sources such as buried

drums remained at the site and, 2) allow access to contaminated soils beneath the mounds. No concentrated sources of contamination or vessels were encountered within the mounds. The mound removal consisted of excavation and off-site disposal of approximately 11,100 cubic yards of soil and debris contained in the three mounds at the site. Upon completion of this removal, a manhole was found which may be a part of the former drainage system used at the site during fire training operations.

b. Feasibility Study, Proposed Plan, and Tiger Team Optimization Review

A proposed plan for removal of soil at the site was prepared following the completion of the Feasibility study for the site (FS). The proposed plan included removal of all soil exceeding risk-based cleanup goals to achieve an unrestricted future use of the site.

An optimization review was conducted by a "Tiger Team" formed of Navy and EPA personnel in 2005 to determine if the proposed plan should be carried out. The review noted that the proposed plan would require removal of nearly all vadose zone soils at the site to achieve the unrestricted land use goal. It was also noted that following the completion of the FS report, the anticipated land use changed from unrestricted to a commercial/industrial with restricted passive recreational access (traverse paths). The Tiger Team recommended that the FS be revised to address the new land use and consider land use controls as part of the remedial action, and not restrict the remedial alternatives to an unrestricted land use goal.

However, it was further recognized that the soils exceeding the upper concentration limits required removal regardless of planned land use, and some structures known to exist (remnant outfall piping, the suspected oil – water separator, and three former building foundations) may be acting as continuing sources of contaminant releases. It was agreed by that Tiger Team that these targets should be addressed through a NTCRA.

Finally, it was noted that the shoreline protection at the site consists partially of fill including concrete and asphalt, and this material was not fully protective of erosion of the shoreline. The Tiger Team recommended that an engineered stone revetment be installed to prevent any erosion of soil containing debris, PAHs, and metals into the marine environment and to remove shoreline material that may provide contributing contamination.

Therefore, the Navy proposes implementation of the Tiger Team recommendations to conduct the following as a removal action:

- Remove soil with contaminant concentrations exceeding upper concentration limits for petroleum.
- Remove a manhole and suspected oil-water separator found underneath the central mound during removal of the mound.
- Remove three foundations found in the subsurface of the site during remedial investigations and predesign investigations between 1998 and 2004,
- Remove one 8-inch cast iron drainage pipe presumed to have discharged oily water and waste from the site during operations. Seek a second such drainage pipe shown on historic drawings and remove if found.
- Remove building debris from the shoreline, design and install an engineered stone revetment that will prevent erosion of soil containing low concentrations of PAH and lead contaminants in the soil to the sediments of Coasters Harbor.

c. Current Actions. The Navy has initiated contracting actions to implement the Tiger Team recommendations as described above. The removal action as described in this Action Memorandum is anticipated to be conducted in 2007 and 2008.

5. STATE AND LOCAL AUTHORITIES ROLE

a. State and Local Actions to Date. The site is located on property held by the Navy, and as such the Navy holds responsibility for removal actions, risk reduction and remediation of the site as needed. State and Local authorities have not undertaken any removal actions at the site, other than providing oversight of studies and actions conducted by the Navy. The State provides oversight of actions and review of documents for the site. The local community provides input on the Navy's action through participation in the Restoration Advisory Board, a group of community members who meet with Navy representatives periodically to discuss progress and provide input on Installation Restoration Program (IRP) sites.

b. Potential for Continued State and Local Response. The ownership of the land at Coasters Harbor Island is not anticipated to change in the foreseeable future, and the Navy will retain responsibility for the site. Therefore, there is no anticipated need for state or local lead on removal or remedial actions for this site. The State of Rhode Island will continue to oversee the investigations and removal actions and the local community will continue to provide input on actions conducted at the site through the Restoration Advisory Board.

6. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

Potential threats to public health, welfare or the environment posed by site contaminants, and statutory and regulatory authorities that apply to the site are discussed in this section.

a. Threats to Public Health or Welfare. Petroleum exceeds the RIDEM upper concentration limit of 30,000 mg/kg. There is a presumption that concentrations of petroleum in excess of 30,000 mg/kg pose a threat of health effects to humans, through the presence of associated PAHs. Risk assessments conducted to date show acceptable risks from contaminants present to recreational users exposed to surface soil and to excavation workers exposed to surface and subsurface soil. Risk to individuals under an industrial/commercial use has not been calculated, but will be quantified in a revised Feasibility Study, currently under preparation.

b. Threats to the Environment. Concentrations of contaminants present in the soil including PAHs, petroleum, and lead may contribute to sediment contamination in Coasters Harbor through erosion of those soils and may thus pose a risk of adverse effects to ecological receptors. In addition, structures and foundations found during the predesign investigation are present that may be providing a continuing source of contaminants to the site and surrounding marine sediments.

c. Regulatory Authorities. Petroleum exceeds the RIDEM upper concentration limit of 30,000 mg/kg. The presence of this level of petroleum in soil at the site constitutes a violation of those regulations. The Navy is required to take response actions pursuant to CERCLA under the terms of the FFA.

7. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this Action memorandum, may present an elevated risk of endangerment to public health, or welfare, or the environment. The Navy has determined that this threat can be abated, minimized, or eliminated by undertaking a removal action.

8. PROPOSED ACTIONS AND ESTIMATED COSTS

This section describes the proposed removal action to mitigate the conditions cited in Section 6, above.

a. Proposed Action. The proposed soil removal action consists of the excavation, transportation and off-site disposal of contaminated soil, foundations and other structures at the OFFTA Site. Following

excavation, the removal areas will be backfilled, graded to the base grade elevation present across the Site, and a stone revetment will be constructed along the shoreline to protect it from erosion.

The removal of contaminated soil and structures was proposed to the public in July 2003. Comments on the proposed removal action have been received from the EPA, RIDEM, and the public and are provided in a responsiveness summary (Attachment C). The responsiveness summary provides the Navy's response to the public comments to the proposed plan for the removal action. The comments have been taken into consideration and support the removals proposed. However, because the quantities anticipated for removal have been revised since 2003, the revisions will be brought to the public through the Restoration Advisory Board (RAB) on January 17, 2007. In addition, a Fact Sheet Update will be provided in late January 2007 to describe progress to date and changes recommended by the Tiger (review) Team. The final remedy will be presented to the general public for comment after it is determined.

The major components of the proposed removal action and the basis for the proposal are provided below. Details of the actions and methods to perform the soil removal action will be described in two documents yet to be prepared: 1) the Removal Action Work Plan and 2) the Design for Replacement Stone Revetment. Both documents will be made available to the public through the RAB and to the Regulatory review parties for review and comment. The following paragraphs describe the major components of this proposed action.

RA Work Plan – A Removal Action (RA) work plan will be prepared and submitted to the regulatory parties for review as a draft and a draft final in order to solicit and address their concerns on the execution of the removal action. A final RA work plan will also be prepared and distributed to provide a plan for execution of the project. The RA work plan will describe the details of the removals, schedule, the action limits, sampling to be conducted, and limits of the removals.

Staging Area Setup – Prior to the start of excavation, staging areas, decontamination areas and site access controls will be set up. Fences will be opened as necessary for bringing equipment to the site then re-secured. Staging areas will be sized to accommodate the excavated soil.

Erosion Control – Erosion control measures will be set up to prevent runoff or erosion of soil and debris from the site and staging areas. In areas along the shoreline, erosion controls will be constructed to prevent storm, wave and wind erosion.

Soil, Fill, and Debris Removal – The removal action will consist of four components, as described below. Figure 3 shows the target excavation areas.

- Soil containing petroleum at concentrations above 30,000 mg/kg will be removed from the area where found. Based on extensive sampling conducted, this area is anticipated to cover 2116 square feet, extend to 8 feet below ground surface and involve the removal of an estimated 450 cubic yards of soil (Note that the depth of 8 feet may in fact be greater, based on confirmation sampling to be conducted.)
- Three foundations that were found during the removal action evaluation in 1998 will be excavated, demolished and removed from the subsurface. Any piping found leading to or from these foundations will be opened, inspected, and evaluated to determine if they constitute a possible continuing source of contamination. If there is a reason to believe the are or are connected to a continuing source, or if they have previously been a source of contamination, they will be removed through excavation. The three foundation excavations are each presumed to involve an area of 2200 square feet, extend 6 feet below ground surface and involve removal of 380 cubic yards of soil and concrete.
- The manhole uncovered during the mound removal action will be opened, inspected, emptied, and then the associated structure will be excavated, demolished and removed. Any piping found leading to or from these foundations will be inspected to determine if remnant piping constitutes a continuing source of petroleum or PAH contamination to the site. The manhole

excavation is anticipated to involve an area approximately 1300 square feet, extend 8 feet below ground surface and involve the removal of approximately 250 cubic yards of soil and concrete.

- The 8 inch cast iron drainage pipe found at the shoreline during the removal action evaluation in 1998 will be excavated, demolished and removed from the subsurface. Any connecting piping found will be inspected to determine if this remnant piping constitutes a continuing source of petroleum or PAH contamination to the site. The drain pipe excavation area is anticipated to impact an area 1400 square feet, extend to a depth of 8 feet below ground surface and involve the removal of approximately 250 cubic yards of soil and debris.

Stone Revetment – The existing shoreline protection material will be removed and replaced with an engineered stone revetment constructed along the shoreline to stabilize the shoreline and protect it from erosion.

- The design of the stone revetment will be presented as a 30% and a 90% for review by the regulatory parties, and a 100% design for distribution as a Navy contract bid package.

- The stone revetment will be designed and constructed to withstand a 100 year storm.

- The stone revetment will be constructed to cover the intertidal sediment which contains some amount of asphalt and fill, preventing further erosion of this fill into the subtidal area.

- The installation of the stone revetment will require excavation of some intertidal soil and sediment for the purposes of anchoring the revetment into the ground and protecting it from movement during storm events. The volume of material to be removed will be determined from a design-wave analysis, which is a calculation of how deep a seawall revetment needs to be anchored into the subsurface material to prevent washout. It is anticipated that the revetment may be anchored two to four feet below the existing ground surface, along a part of the shoreline.

- During construction, erosion control measures including "port-a-dam" and/or silt curtains will be set up to prevent runoff or erosion of soil and debris from the excavation and construction areas.

- The stone revetment will be designed and constructed to protect the eelgrass beds and shellfish beds that are present in close proximity to this construction area. This will be accomplished through proper slope design, no encroachment into the subtidal areas and if necessary, reduction in the land portion of the site to achieve adequate space between the action areas and protected areas.

NAPL Controls During Excavation – Care will be taken during excavation to minimize the spread of NAPL to less contaminated areas. Any NAPL that accumulates on the water table during excavation will be captured and pumped from the excavations, and/or controlled by use of adsorbent pads or booms to prevent its migration. If it is believed that NAPL will continue to seep out of adjoining soil into an excavation area after backfill, a low-cost passive NAPL collection system can be installed in an excavation to address this possibility.

Confirmation Sampling – Confirmation samples (also previously termed post-excavation samples) will be collected from the bottom and sides of excavations and analyzed for the removal action goal for TPH (30,000 mg/kg) to determine if the excavation is complete. The RA work plan will specify frequency of sampling.

Staging of Material – Excavated soil and debris materials will be segregated and staged in covered stockpiles of like material (according to type and/or disposal facility) in the staging area. Materials may include soils, tree stumps, root balls, concrete, rebar, brick, wood, metal, asphalt and building rubble.

Soil will be tested to determine the appropriate disposal facility. Any free liquids released from excavated material will be managed to prevent migration of contamination.

Waste Disposal – Stockpiled materials will be sampled and analyzed for characterization purposes and to facilitate disposal. After profiling and manifesting, material will be shipped to the approved disposal facility.

Site Restoration – Excavated areas will be backfilled with clean fill and 4 inches of top soil. The excavated areas and other areas damaged during the removal action will be restored the original base grade elevation and seeded to prevent surface erosion.

b. Contribution to Remedial Performance. The final remedy decision for the site has not been determined. The Tiger Team Optimization Review advised that the Feasibility Study completed in 2002 should be revised because 1) It was not accepted by the regulatory parties, and 2) because it limited the remedial alternatives evaluated to unrestricted land use, a limitation which is no longer applicable. However, the remedy decision as foreseen by the Tiger Team is anticipated to consist of a series of removal actions and land use controls appropriate for the planned land use at this site.

By removing soil exceeding upper concentration limits, the on-shore soil removal action will significantly reduce the potential human health risk posed by on-shore soils. Removing the suspected oil – water separator, the former drainage line, and the former building foundations, any associated sources of continuing contamination will be removed from the site. Removal of the asphalt and fill placed as shoreline protection and replacing that debris with an engineered stone revetment will reduce the potential for contaminant migration into the marine sediments via erosion of the soil and fill, thereby reducing the potential risk to off-shore ecological receptors.

The completion of this removal action will not hinder the performance of any anticipated action to be conducted as a part of the final remedy.

c. Alternative Actions Considered. A range of alternative technologies were evaluated in the Feasibility Study completed in 2002. These were considered for the performance of the removal action, because it was noted that this action needs to be complimentary to the final remedy decision.

- no action - eliminated because it does not meet removal action goals;
- removal, ex-situ treatment and backfill – eliminated after detailed analysis due to extended time required to meet removal action goals and high cost for treatment;
- removal and off site disposal .

Cap and land use control alternatives were not evaluated in the FS report because there was an undetermined land use at the time.

Removal and disposal of target structures and contaminated soils exceeding upper concentration limits was selected as it is the only alternative that would be complimentary to any selected final remedy.

d. Applicable or Relevant and Appropriate Requirements (ARARs). The removal action complies with the following federal and state ARARs:

- Coastal Zone Management Act (16 USC Parts 1451 et. seq.) – Actions must meet applicable coastal zone management requirements and protect resource areas.
- Floodplain Management (Executive Order 11988; 40 CFR Part 6, Appendix A) – Actions must preserve beneficial value of the floodplain.
- Clean Air Act (CAA), National Emission Standards for Hazardous Air Pollutants (NESHAPS) (USC 7411, 7412; 40 CFR Part 61) – Requirements for monitoring of air emissions must be met; activities will be carried out in a manner which will minimize potential air releases.

- Resource Conservation and Recovery Act (RCRA), Subtitle C - Standards for Hazardous Waste Facilities (42 USC 6291 et seq.) - Soils and debris must be tested, and if hazardous, handled and disposed according to standards.
- Clean Water Act (CWA), Section 402, National Pollutant Discharge Elimination System (NPDES) (33 USC 1342; 40 CFR Parts 122-125, 131) - Regulated discharges into surface waters must meet ambient water quality criteria.
- Rhode Island Remediation Regulations (CRIR 12-180-001, Section 8; DEM-DSR-01-93, as amended August 1996 and August 2004) – Removal will be directed by presence of soil exceeding upper concentration limits for petroleum (>30,000 mg/kg)
- Rhode Island Coastal Resources Management (RIGL 46-23-1 et seq.) – Actions must address applicable coastal resource management requirements.
- Rhode Island Clean Air Act - Fugitive Dust Control (RIGL 23-23 et seq.; CRIR 12-31-05) – Actions must take reasonable precaution to prevent particulate matter from becoming airborne.
- Rhode Island Clean Air Act - Emissions Detrimental to Persons or Property (RIGL 23-23 et seq.; CRIR 12-31-07) – Actions must prevent airborne emissions of contaminants that may be injurious to humans, plant or animal life or cause damage to property.
- Rhode Island Clean Air Act - Air Pollution Control (RIGL 23-23 et seq.; CRIR 12-31-09) - Removal action air emissions must be monitored and emissions controlled if necessary.
- Rhode Island Clean Air Act - Air Toxics (RIGL 23-23 et seq.; CRIR 12-31-22) - Removal action air emissions must be monitored to assess compliance and operation and maintenance activities carried out in to minimize potential air releases.
- Rhode Island Hazardous Waste Management Standards for Treatment, Storage, and Disposal Facilities (RIGL 23-19.1 et seq.; CRIR 12-030-003) – Soils and debris must be tested, and if hazardous, handled and disposed according to standards.

In addition to the ARARs provided above, the following regulations are cited as regulations "to be considered" during conduct of the proposed removal action:

- Rhode Island Remediation Regulations DEM-DSR-01-93 as amended, remaining sections
- Rhode Island Underground Storage Tank Regulations DEM-OWM-UST06-05
- Rhode Island Leaking Underground Storage Tank Regulations
- Rhode Island Above Ground Storage Tank Regulations
- Rhode Island Oil Pollution Control Regulations
- Rhode Island Water Pollution Control Regulations

e. Project Schedule. The following project schedule has been developed in accordance with the FFA, required times for completion of tasks and other constraints.

Milestone	Proposed Start Date	Proposed Completion Date
On-shore Removal Action Work Plan	10/1/06	8/19/07
Soil Excavation and Removal	8/20/07	1/17/08
Removal Completion Report	1/17/08	9/4/08
Stone Revetment Design	8/20/07	1/17/08
Stone Revetment Construction	6/1/08	11/1/08
Stone Revetment Completion Report (As-Built)	11/1/08	1/1/09

All dates are subject to funding constraints

f. Estimated Costs. The estimated cost for the proposed removal action is currently estimated at approximately $3.3M, to be conducted in two phases: The planning documents, design, and soil removal is estimated at $1.3M, and the stone revetment construction is estimated at approximately $2M. The estimate for the stone revetment will be revised after the design is completed. There are no long-term operation, maintenance, or monitoring costs associated with this removal action, although monitoring of the revetment will be required, and noted in the Final ROD as appropriate.

9. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

If the removal action is not conducted, the contaminant concentrations in the soil may degrade, with bacterial action reducing the hydrocarbons in the soil. However, concentrations will likely decrease slowly over time. Shoreline and debris erosion will continue, possibly resulting in further sediment contamination in Coasters Harbor.

10. OUTSTANDING POLICY ISSUES

None identified at this time.

11. ENFORCEMENT

The action is being undertaken voluntarily by the Navy in accordance with the Federal Facilities Agreement for the NAVSTA Newport IRP. Regulatory agencies are anticipated to remain in an oversight role for the duration of the removal action, approving design documents, removal documentation and completion reports in order to continue to move toward a permanent remedy for the site.

12. RECOMMENDATION

The removal of the highly contaminated on-shore soil, and removal of the structures will reduce the risk of exposure of contaminants at the site. The removal of debris from the shoreline and installation of an engineered stone revetment will reduce further erosion of contaminated soils from the bluff face to the sediments along the shoreline and will reduce migration of contaminants from the site soils into groundwater. Therefore, the Navy recommends the implementation of the proposed Soil Removal NTCRA.

Approvals:

NAVSTA Newport

CAPT Todd W. Malloy
Commanding Officer

Date: 1 FEB 07

REFERENCES

TRC Environmental Corporation, 1992. Phase 1 Remedial Investigation Report, Naval Education and Training Center, Newport, Rhode Island. TRC, S. Windsor, Connecticut. January.

Brown and Root Environmental Corporation, 1998. Source Removal Evaluation Report, for the Old Fire Fighting Training Area, Naval Education and Training Center, Newport Rhode Island. Brown and Root Environmental, Wilmington, Massachusetts. January.

Tetra Tech NUS, Inc., 1999. Human Health Risk Assessment Report for Recreational Use, Old Fire Fighting Training Area/Katy Field, Naval Station Newport, Newport Rhode Island. Tetra Tech NUS, Inc, Wilmington Massachusetts. May.

Tetra Tech NUS, Inc., 2000. Draft Background Soil Investigation for the Old Fire Fighting Training Area, Naval Station Newport, Newport Rhode Island. Tetra Tech NUS, Inc., Wilmington Massachusetts. May.

SAIC and the University of Rhode Island, 2000. Marine Ecological Risk Assessment Report, Old Fire Fighting Training Area, Naval Station Newport, Newport Rhode Island. SAIC and URI Graduate School of Oceanography, Narragansett Rhode Island. April.

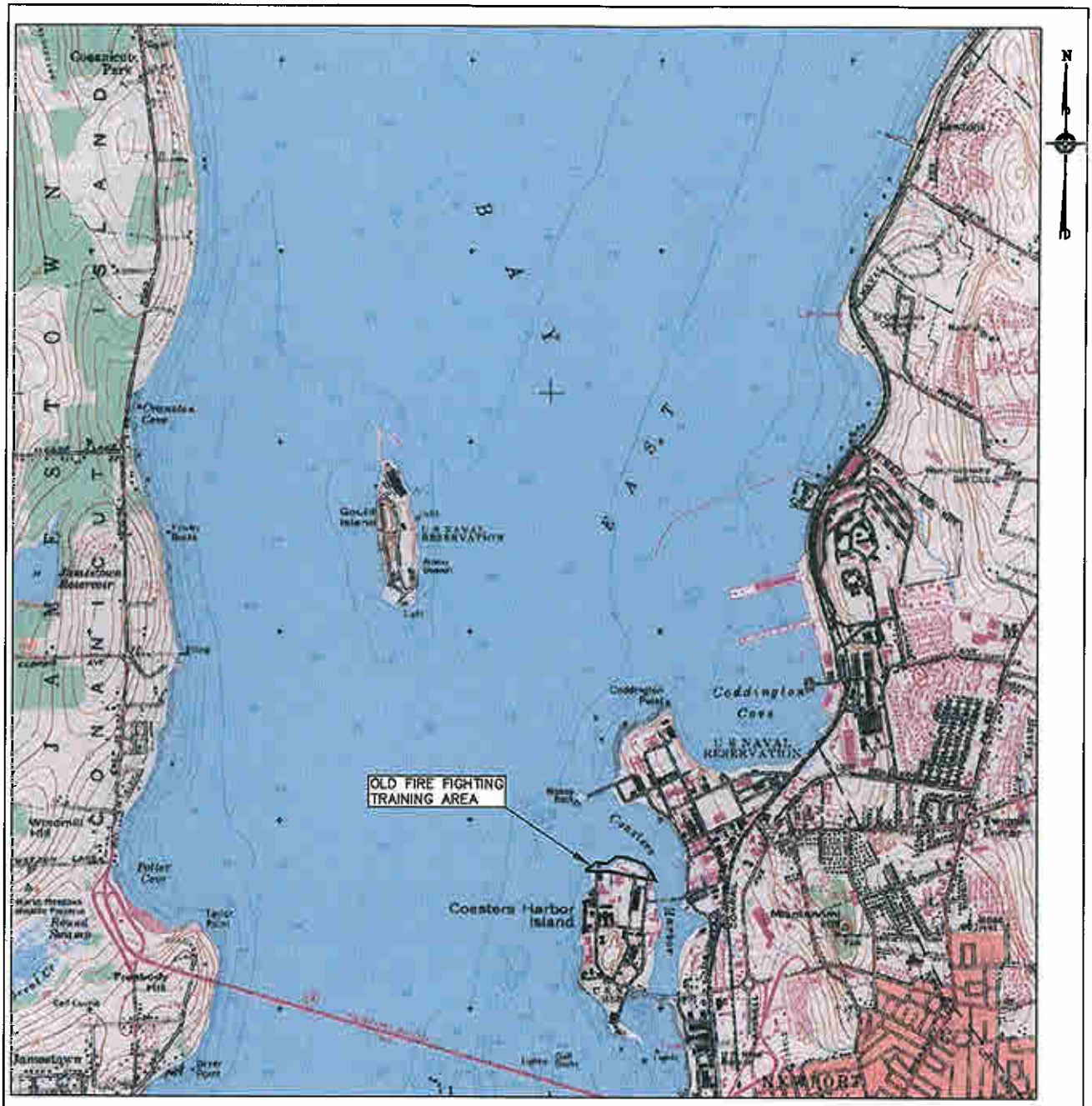
Tetra Tech NUS, Inc. 2001. Remedial Investigation Report, for the Old Fire Fighting Training Area, Naval Station Newport, Newport Rhode Island. Tetra Tech NUS, Inc., Wilmington Massachusetts. July.

Tetra Tech NUS, Inc. 2002. Feasibility Study Report for the Old Fire Fighting Training Area, Naval Station Newport, Newport Rhode Island. Tetra Tech NUS, Inc., Wilmington Massachusetts. September.

Tetra Tech NUS, Inc. 2004. Mound Summary Report for the Old Fire Fighting Training Area, Naval Station Newport, Newport Rhode Island. Tetra Tech NUS, Inc., Wilmington, Massachusetts. March.

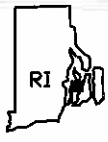
Tetra Tech NUS, Inc., 2005. Final Soil Pre-Design Investigation Report for the Old Fire Fighting Training Area, Naval Station Newport, Newport Rhode Island. Tetra Tech NUS, Inc., Wilmington Massachusetts. April.

Attachment A – Figures



BASE MAP IS A PORTION OF THE FOLLOWING 7.5 X 15 MINUTE U.S.G.S. QUADRANGLE:
PRUDENCE ISLAND, RHODE ISLAND, 1955, PHOTOREVISED 1970 AND 1975

GRAPHIC SCALE
0 0.5 MILE 1 MILE



QUADRANGLE LOCATION

SITE LOCUS

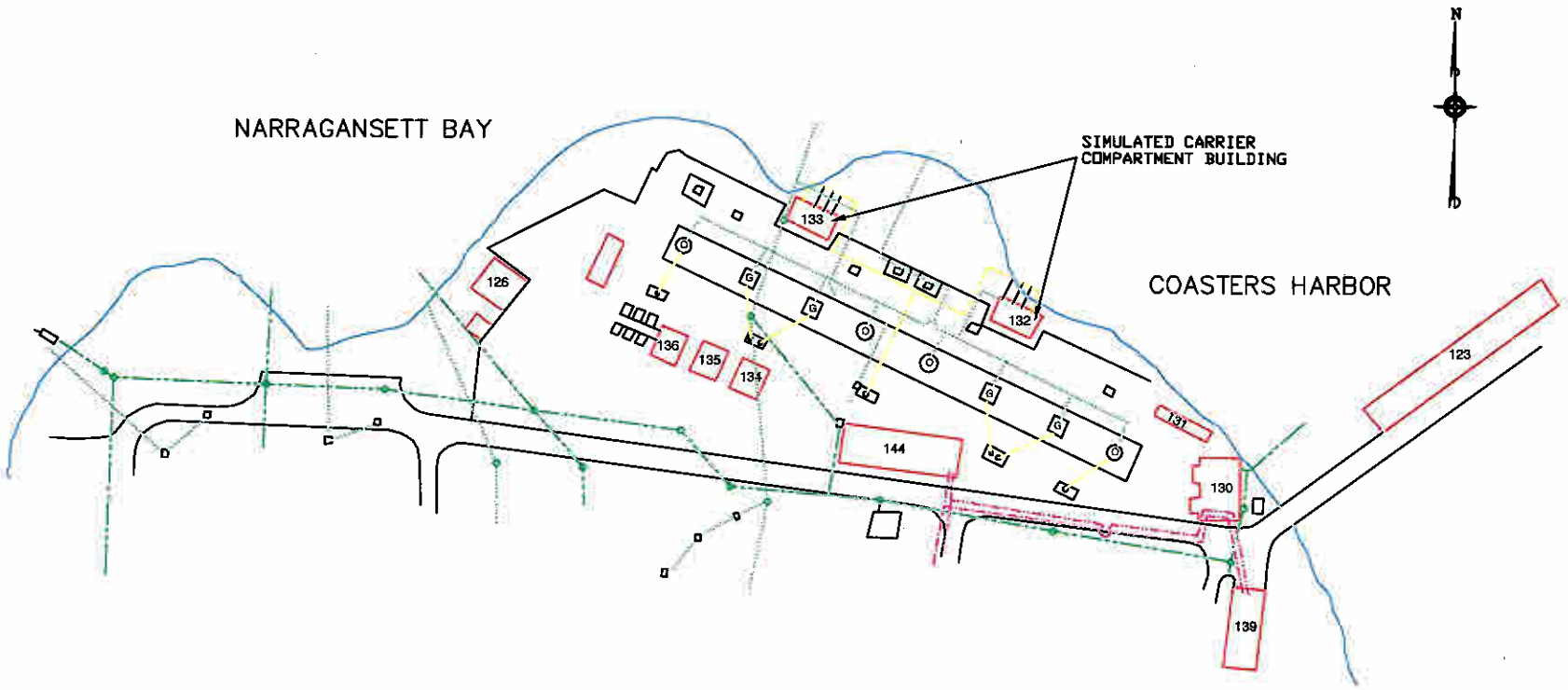
OLD FIRE FIGHTING TRAINING AREA

NAVSTA NEWPORT – NEWPORT, RHODE ISLAND

DRAWN BY:	D.W. MACDOUGALL	REV.:	0
CHECKED BY:	S. PARKER	DATE:	AUGUST 11, 2006
SCALE:	AS NOTED	ACAD NAME:	\1611\1410\FIG_1.DWG

FIGURE 1

TETRA TECH NUS, INC.
55 Jonspin Road Wilmington, MA 01887
(978)658-7899



LEGEND

- 135 — BUILDING AND BUILDING ID
- STEAM LINE RETURN
- STEAM LINE SUPPLY
- STORM SEWER LINE
- SANITARY SEWER LINE
- OIL LINE
- OIL TANKS
- GAS TANKS

SOURCE: MASTER SHORE STATION DEVELOPMENT PLANS, US NAVAL STATION NEWPORT, R. I., 1953

HISTORIC FEATURES			FIGURE 2
OLD FIRE FIGHTING TRAINING AREA			
NAVSTA NEWPORT – NEWPORT, RHODE ISLAND			
DRAWN BY:	D.W. MACDOUGALL	REV.:	0
CHECKED BY:	S. PARKER	DATE:	AUGUST 11, 2006
SCALE:	NOT TO SCALE	FILE NO.:	\1611\1410\FIG_2.DWG

TETRA TECH NUS, INC.
55 Jonspin Road Wilmington, MA 01887
(978)658-7899

NOTES:

1. BASE MAP FROM A PLAN BY LOUIS FEDERICI & ASSOCIATES, PROVIDENCE, RI, PLS STAMP DATED: 06/10/05, ENTITLED: "SURFACE WARFARE OFFICERS SCHOOL (SWOS) SITE, 2005 – TOPOGRAPHIC SURVEY, SOIL BORINGS, MONITORING WELLS AND FEATURE LOCATION AT THE OLD FIRE FIGHTING TRAINING AREA, NEWPORT NAVAL BASE, IN NEWPORT, RHODE ISLAND FOR TETRA TECH NUS, INC.", ORIGINAL SCALE: 1"=50 FT., PLAN DATUM HORIZONTAL: NAD 83 (FEET), VERTICAL: NAVAL BASE MEAN LOW WATER.

2. TPH GRADIENT LEVELS DIGITIZED FROM FIGURE CREATED BY A KRIGING INTERPOLATION MODEL THROUGH ARCVIEW / EGIS USING DATA COLLECTED BETWEEN 2003 AND 2005; KRIGING SLICE IS AT 2 FT. ELEVATIONS (NAVAL BASE MEAN LOW WATER)

3. ALL LOCATIONS ARE TO BE CONSIDERED APPROXIMATE.

4. PLAN NOT TO BE USED FOR DESIGN.

GRAPHIC SCALE
0' 120' 240'

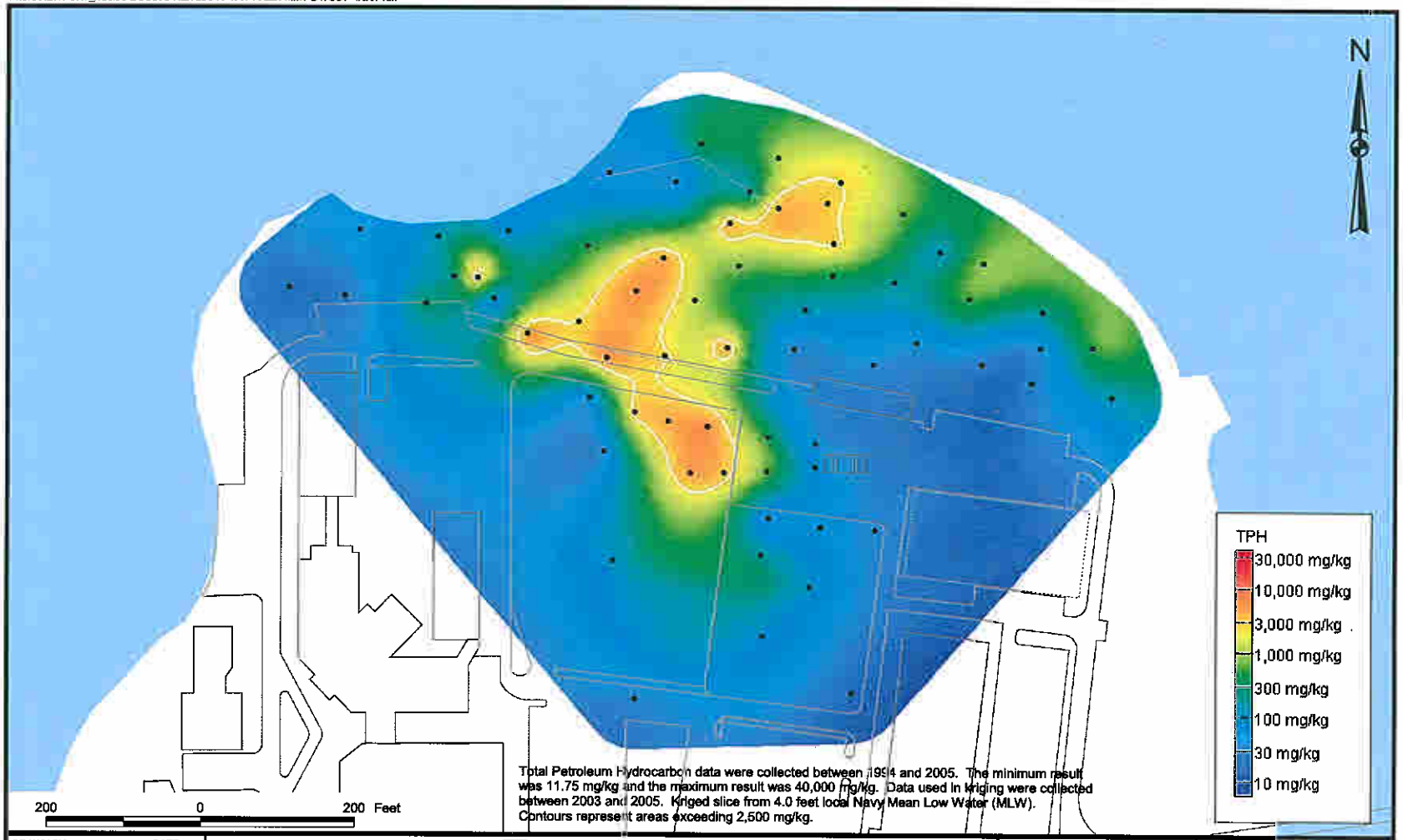
REMOVAL ACTION TARGET AREAS
SITE 09 – OLD FIRE FIGHTING AREA
NAVSTA NEWPORT – NEWPORT, RHODE ISLAND

DRAWN BY:	D.W. MACDOUGALL	REV.:	0
CHECKED BY:	S. PARKER	DATE:	AUGUST 11, 2006
SCALE:	AS NOTED	FILE NO.:	\1811\1410\FIG_8.DWG

FIGURE 3

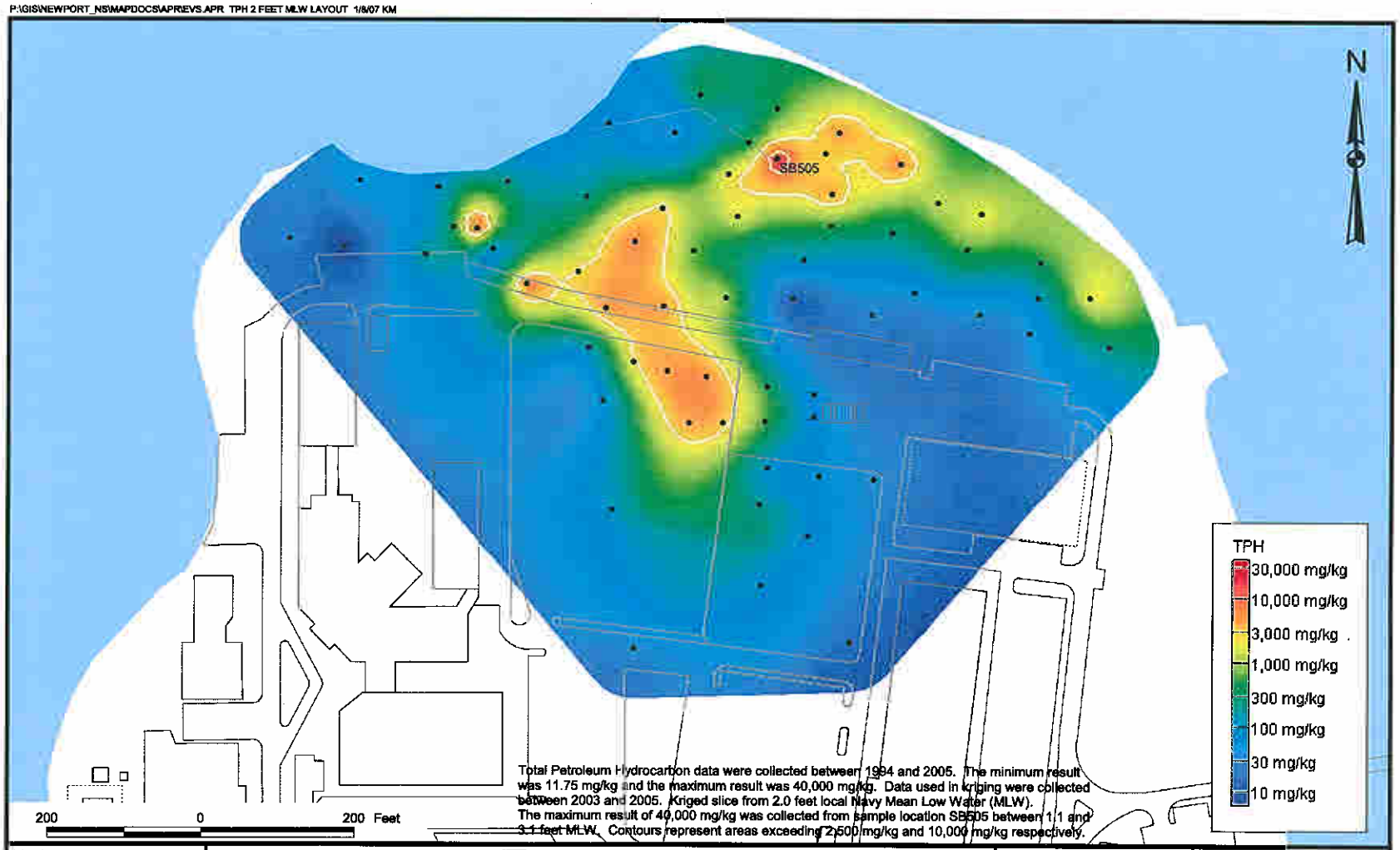
TETRA TECH NUS, INC.
55 Jonspin Road Wilmington, MA 01887
(978)658-7899

P:\GIS\NEWPORT_NS\MAPDOCS\APR\EVS.APR TPH 4 FEET MLW LAYOUT 1/8/07 KM



DRAWN BY: A. JANOCHA — DATE: 3/02/06	Tetra Tech NUS, Inc.	CONTRACT NUMBER: CTO 0833	OWNER NUMBER: N5339
CHECKED BY: S. PARKER — DATE: 1/8/07	TOTAL PETROLEUM HYDROCARBONS IN SOIL (2003 - 2005) AT ELEVATION 4 FEET MLW SITES 09 & 20 NAVAL STATION NEWPORT NEWPORT, RI	APPROVED BY — DATE	
COST/SCHEDULE-AREA		APPROVED BY — DATE	
SCALE: AS NOTED		DRAWING NO.: FIGURE 4	REV: 0

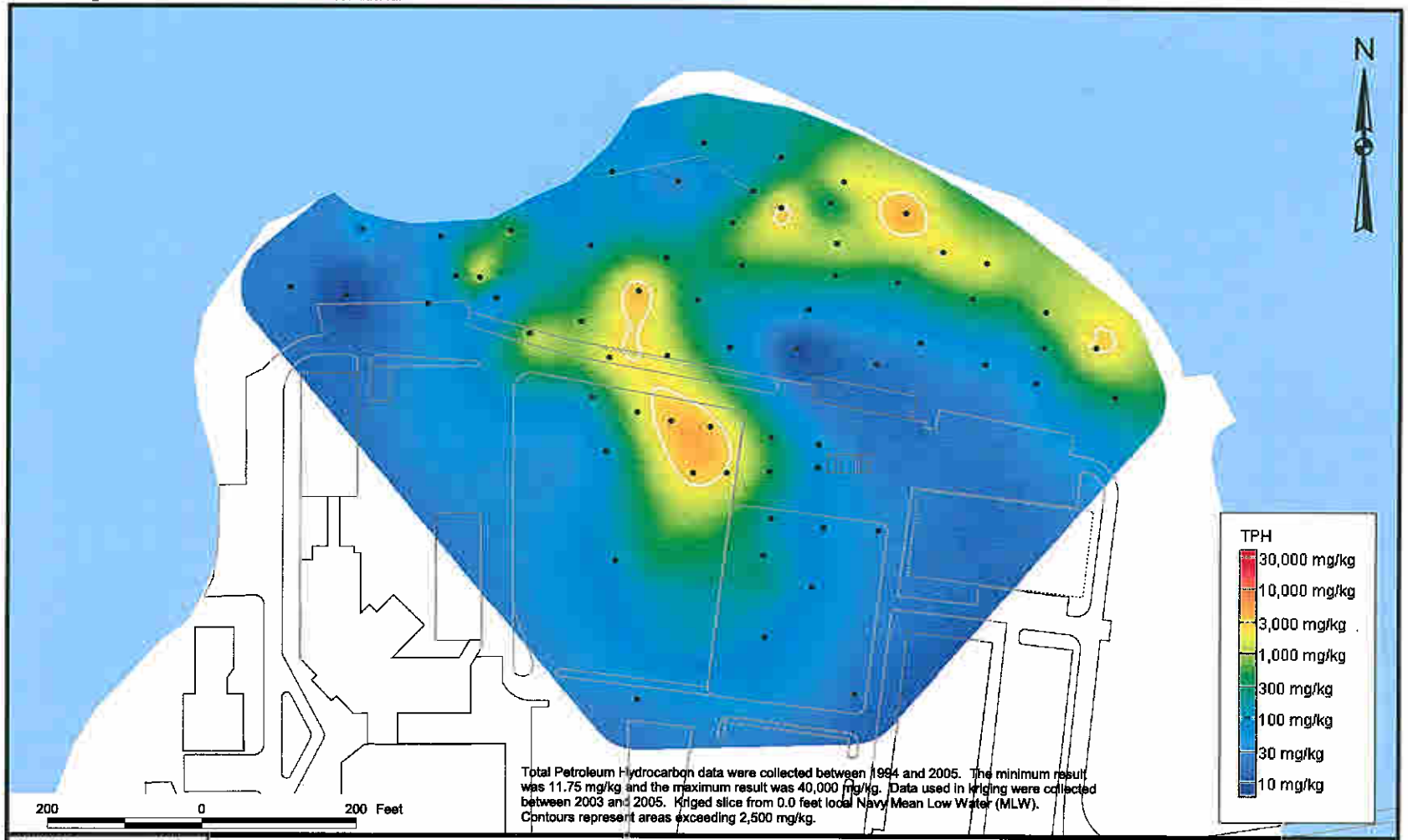
P:\GIS\NEWPORT_NS\MAPDOCS\APR\EVS.APR TPH 2 FEET MLW LAYOUT 1/8/07 KM



Total Petroleum Hydrocarbon data were collected between 1994 and 2005. The minimum result was 11.75 mg/kg and the maximum result was 40,000 mg/kg. Data used in kriging were collected between 2003 and 2005. Kriged slice from 2.0 feet local Navy Mean Low Water (MLW). The maximum result of 40,000 mg/kg was collected from sample location SB505 between 1.1 and 3.1 feet MLW. Contours represent areas exceeding 2,500 mg/kg and 10,000 mg/kg respectively.

DRAWN BY: A. JANOCHA — DATE: 3/02/06	Tetra Tech NUS, Inc.	CONTRACT NUMBER: CTO 0833	OWNER NUMBER: N5339
CHECKED BY: S. PARKER — DATE: 1/8/07	TOTAL PETROLEUM HYDROCARBONS IN SOIL (2003 - 2005) AT ELEVATION 2 FEET MLW SITES 09 & 20 NAVAL STATION NEWPORT NEWPORT, RI	APPROVED BY — DATE	
COST/SCHEDULE-AREA		APPROVED BY — DATE	
SCALE: AS NOTED		DRAWING NO.: FIGURE 5	REV: 0

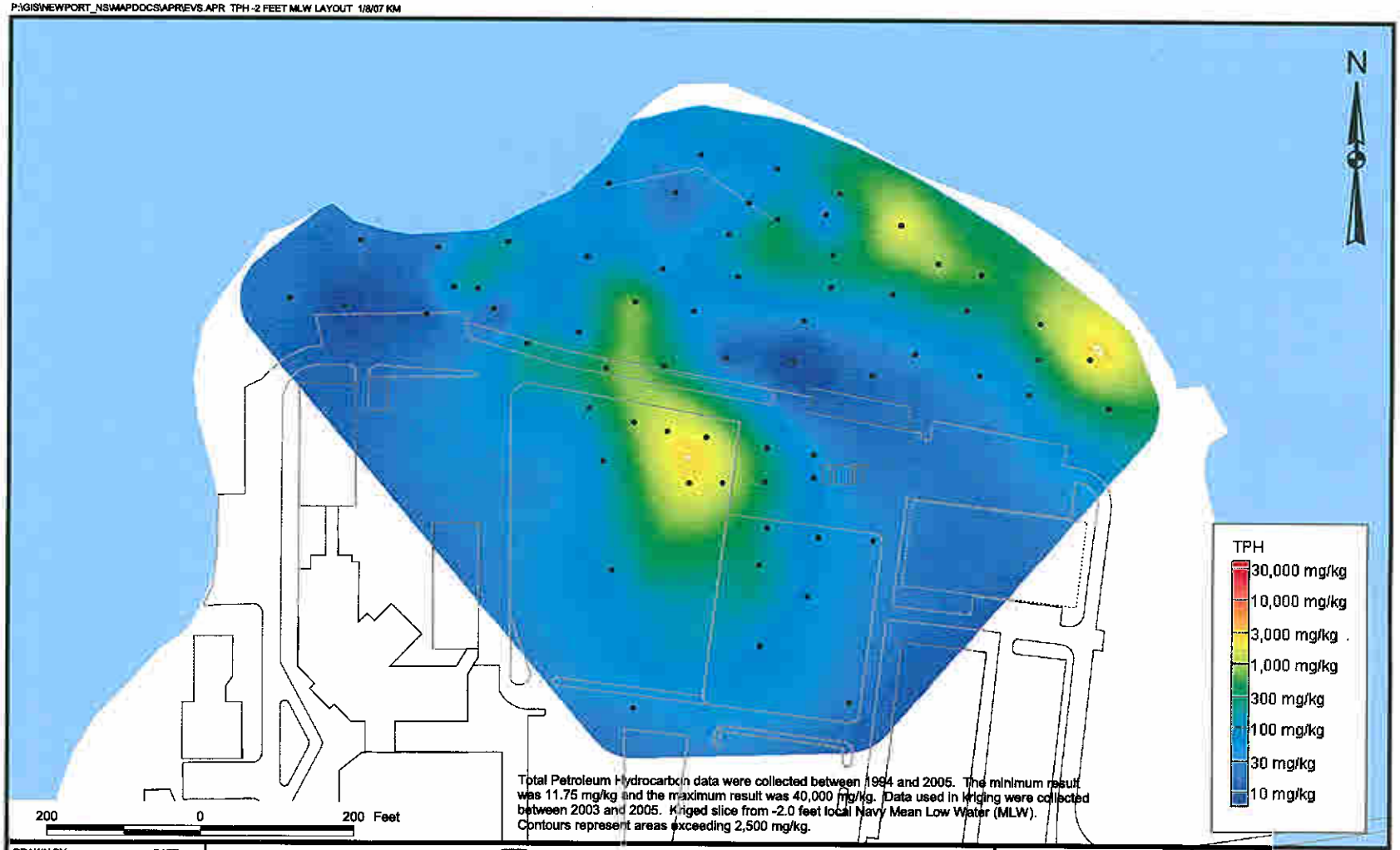
P:\GIS\NEWPORT_NS\MAPDOCS\APR\EVS.APR TPH 0 FEET MLW LAYOUT 1/8/07 KM



Total Petroleum Hydrocarbon data were collected between 1994 and 2005. The minimum result was 11.75 mg/kg and the maximum result was 40,000 mg/kg. Data used in kriging were collected between 2003 and 2005. Kriged slice from 0.0 feet local Navy Mean Low Water (MLW). Contours represent areas exceeding 2,500 mg/kg.

DRAWN BY: A. JANOCHA — DATE: 3/07/06	Tetra Tech NUS, Inc.	CONTRACT NUMBER: CTO 0833	OWNER NUMBER: N5339
CHECKED BY: S. PARKER — DATE: 1/8/07	TOTAL PETROLEUM HYDROCARBONS IN SOIL (2003 - 2005) AT ELEVATION 0 FEET MLW SITES 09 & 20 NAVAL STATION NEWPORT NEWPORT, RI	APPROVED BY — DATE	
COST/SCHEDULE-AREA		APPROVED BY — DATE	
SCALE: AS NOTED		DRAWING NO.: FIGURE 6	REV: 0

P:\GIS\NEWPORT_NS\MAPDOCS\APR\EVS.APR TPH -2 FEET MLW LAYOUT 1/8/07 KM



Total Petroleum Hydrocarbon data were collected between 1994 and 2005. The minimum result was 11.75 mg/kg and the maximum result was 40,000 mg/kg. Data used in kriging were collected between 2003 and 2005. Kriged slice from -2.0 feet local Navy Mean Low Water (MLW). Contours represent areas exceeding 2,500 mg/kg.

DRAWN BY: A. JANOCHA — DATE: 3/07/06	Tetra Tech NUS, Inc.	CONTRACT NUMBER: CTO 0833	OWNER NUMBER: N5339
CHECKED BY: S. PARKER — DATE: 3/08/06	TOTAL PETROLEUM HYDROCARBONS IN SOIL (2003 - 2005) AT ELEVATION -2 FEET MLW SITES 09 & 20 NAVAL STATION NEWPORT NEWPORT, RI	APPROVED BY — DATE	
COST/SCHEDULE-AREA		APPROVED BY — DATE	
SCALE: AS NOTED		DRAWING NO.: FIGURE 7	REV: 0

Attachment B
Admin Record Index of Site Specific Documents

NAVAL STATION NEWPORT
ADMINISTRATIVE RECORD FILE - SITE 09

AR Sect.	ID No.	JOB No.	Doc. No.	Site	Date	Doc. Type	Description	Author
4-CD1	124	N5278	DISK 09-2	OFFTA	8/1/1994	REPORT	OFFTA REMEDIAL INVESTIGATION REPORT, DRAFT FINAL	TRC
4-CD1	125	N5278	DISK 09-6	OFFTA	8/1/1994	REPORT	OFFTA HUMAN HEALTH RISK ASSESSMENT, DRAFT FINAL TEXT AND TABLES	TRC
4-CD1	126	N5278	DISK 09-1	OFFTA	8/1/1994	REPORT	OFFTA REMEDIAL INVESTIGATION REPORT, DRAFT FINAL, TEXT AND TABLES	TRC
4-CD1	127	N5278	DISK 09-8	OFFTA	10/1/1994	REPORT	OFFTA ECOLOGICAL RISK ASSESSMENT, DRAFT FINAL, TEXT AND TABLES	TRC
4-CD1	128	N5278	DISK 09-11	OFFTA	11/1/1994	REPORT	OFFTA FEASIBILITY STUDY, DRAFT, TABLES AND TABLES	TRC
4-CD1	484	N7578	W5297176F	OFFTA	1/1/1998	REPORT	SOURCE AREA REMOVAL EVALUATION	BROWN AND
4-CD1	133	N5278	44415	OFFTA	11/20/1998	LETTER	RIDEM CONCURRANCE ON 0-1 FOOT SAMPLE INTERVAL FOR SURFACE SOILS AT KATY FIELD	NAVY
4-CD1	134	NA	ELDN 10119	OFFTA	11/23/1998	MINUTES	PROCEEDINGS AT THE FIRST PUBLIC HEARING, KATY FIELD AND OFFTA	IRONS AND ASSOC
4-CD1	136	NA	ELDN 10103	OFFTA	1/25/1999	MINUTES	PROCEEDINGS AT THE SECOND PUBLIC HEARING, KATY FIELD AND OFFTA	IRONS AND ASSOC
4-CD1	138	N5278	45852	OFFTA	3/16/1999	LETTER	EPA ASSESSMENT OF DATA NEEDED TO COMPLETE THE OFFTA RI	USEPA
4-CD1	139	N5278	47589	OFFTA	5/10/1999	REPORT	HUMAN HEALTH RISK ASSESSMENT REPORT, SOIL AND SEDIMENT OFFTA SITE	TTNUS
4-CD1	140	N5278	47171	OFFTA	6/14/1999	LETTER	EPA COMMENTS ON THE DRAFT RISK ASSESSMENT REPORT FOR KATY FIELD	USEPA
4-CD1	141	N5278	47176	OFFTA	6/18/1999	LETTER	RIDEM COMMENTS ON THE DRAFT RISK ASSESSMENT REPORT FOR KATY FIELD	RIDEM
4-CD1	142	N5278	47232	OFFTA	8/3/1999	LETTER	REPONSE TO RIDEM COMMENTS ON THE DRAFT HUMAN HEALTH RISK ASSESSMENT, KATY FIELD	TTNUS
4-CD1	143	N5278	47233	OFFTA	8/3/1999	LETTER	RESPONSE TO EPA COMMENTS ON THE DRAFT HUMAN HEALTH RISK ASSESSMENT, KATY FIELD	TTNUS
4-CD1	144	N5278	47798	OFFTA	8/30/1999	LETTER	EPA REBUTTAL TO NAVYS RESPONSE TO COMMENTS ON THE DRAFT RISK ASSESSMENT REPORT FOR KATY FIELD	USEPA
4-CD1	148	N5278	53172	OFFTA	6/22/2000	LETTER	HUMAN HEALTH RISK ASSESSMENT EXPOSURE PARAMETER TABLES	TTNUS
4-CD1	149	N5278	54331	OFFTA	7/12/2000	LETTER	RIDEM COMMENTS TO THE HUMAN HEALTH RISK ASSESSMENT EXPOSURE PARAMETERS	RIDEM
4-CD1	152	N5278	54332	OFFTA	8/16/2000	LETTER	RESPONSE TO RIDEM COMMENTS ON THE PROPOSED HHRA EXPOSURE PARAMETERS FOR OFFTA	TTNUS
4-CD1	154	N5278	56132	OFFTA	11/20/2000	LETTER	EPA COMMENTS TO THE DRAFT FINAL RI REPORT FOR OFFTA	USEPA
4-CD1	155	N5278	56153	OFFTA	12/5/2000	LETTER	RIDEM COMMENTS TO THE DRAFT FINAL PHASE 3 RI REPORT FOR OFFTA	RIDEM
4-CD1	156	N5278	55601	OFFTA	12/20/2000	LETTER	RESPONSES TO COMMENTS TO REVISED DRAFT FINAL RI, OFFTA	TTNUS

NAVAL STATION NEWPORT
ADMINISTRATIVE RECORD FILE - SITE 09

AR Sect.	ID No.	JOB No.	Doc. No.	Site	Date	Doc. Type	Description	Author
4-CD1	157	N5278	56169	OFFTA	1/16/2001	LETTER	EPA REBUTTAL TO NAVY RESPONSE TO EPA COMMENTS ON THE DRAFT FINAL RI REPORT, OFFTA	USEPA
4-CD1	160	N5278	56181	OFFTA	2/20/2001	LETTER	RESPONSE TO ADDITIONAL EPA COMMENTS TO THE REVISED DRAFT FINAL RI, OFFTA	TTNUS
4-CD1	163	N5278	56263	OFFTA	3/15/2001	LETTER	EPA REBUTTAL ON NAVY RESPONSE TO ADDITIONAL EPA COMMENTS ON THE DRAFT FINAL RI REPORT, OFFTA	USEPA
4-CD1	165	N5278	56286	OFFTA	4/11/2001	LETTER	NAVY RESPONSE TO EPA REBUTTAL ON RESPONSE TO ADDITIONAL COMMENTS ON THE DRAFT FINAL RI, OFFTA	TTNUS
4-CD1	167	N5278	W5200234F	OFFTA	7/1/2001	REPORT	FINAL REMEDIAL INVESTIGATION REPORT FOR OFFTA	TTNUS
4-CD1	130	N1703	28778	OFFTA	10/16/1995	LETTER	MEMO OF UNDERSTANDING, ECORISK WORK PLAN	TTNUS
4-CD1	131	N1703	38155	OFFTA	4/29/1996	PLAN	ECORISK WORK PLAN ADDENDUM C, DRAFT FINAL, OFFTA	URIGSO
4-CD1	132	N7397	NA	OFFTA	12/18/1998	REPORT	TECHNICAL SUPPORT DOCUMENT (DATA) FOR THE ECOLOGICAL RISK ASSESSMENT, OFFTA	TTNUS
4-CD1	135	N7397	44480	OFFTA	1/20/1999	LETTER	OFFTA ECORISK DATA REVISIONS	TTNUS
4-CD1	137	N7397	44486	OFFTA	2/16/1999	LETTER	OFFTA ECORISK DATA AMEND. 02	TTNUS
4-CD1	145	N7397	48429	OFFTA	9/30/1999	LETTER	RESPONSE TO COMMENTS FOR THE DRAFT FINAL ECOLOGICAL RISK ASSESSMENT, OFFTA	TTNUS
4-CD1	146	N7397	52607	OFFTA	4/28/2000	REPORT	FINAL ECOLOGICAL RISK ASSESSMENT REPORT/TECHNICAL REPORT AND REVISED APPENDIX D	SAIC / URIGSO
4-CD1	162	N7397	56183	OFFTA	3/1/2001	LETTER	ERRATA SHEETS FOR FINAL ERA OFFTA	SAIC
4-CD1	147	N5278	52740	OFFTA	5/22/2000	LETTER	EPA COMMENTS TO THE BACKGROUND SOIL INVESTIGATION REPORT	USEPA
4-CD1	150	N5278	53686	OFFTA	7/13/2000	LETTER	RESPONSE TO RIDEM COMMENTS ON THE DRAFT BACKGROUND SOIL INVESTIGAITON REPORT FOR OFFTA	TTNUS
4-CD1	151	N5278	53687	OFFTA	7/13/2000	LETTER	RESPONSE TO EPA COMMENTS ON THE DRAFT BACKGROUND SOIL INVESTIGATION REPORT FOR OFFTA	TTNUS
4-CD1	153	N5278	54340	OFFTA	8/23/2000	REPORT	FINAL BACKGROUND SOIL INVESTIGATION REPORT, OFFTA	TTNUS
4-CD1	159	N5278	56266	OFFTA	2/8/2001	LETTER	NAVY COMMENTS TO RIDEM PROPOSED STATISTICAL EVALUATION OF BACKGROUND SAMPLING, OFFTA	NAVY
4-CD1	158	N5278	56152	OFFTA	2/7/2001	LETTER	EPA COMMENTS TO THE PROPOSED SEDIMENT PRG DEVELOPMENT FOR OFFTA	USEPA
4-CD1	161	N5278	56179	OFFTA	2/22/2001	LETTER	NAVY RESPONSE TO EPA PROPOSED PRG DEVELOPMENT ALTERNATIVES, OFFTA MARINE SEDIMENT	TTNUS
4-CD1	164	N7397	56112	OFFTA	3/28/2001	LETTER	RESPONSE TO COMMENTS, PROPOSED PRG DEVELOPMENT, OFFTA	TTNUS

NAVAL STATION NEWPORT
ADMINISTRATIVE RECORD FILE - SITE 09

AR Sect	ID No	JOB No	Doc No	Site	Date	Doc Type	Description	Author
4-CD1	166	NA	EPA_EMAIL_04 2301	OFFTA	4/23/2001	LETTER	COMMENTS TO TTNUS CORRESPONDENCE ON PRG DEVELOPMENT DOCUMENT, OFFTA	EPA
4-CD1	432	N7397	67487	OFFTA	11/9/2001	REPORT	DRAFT FINAL PRGs - MARINE SEDIMENT	TTNUS
4-CD1	431	N7397	59250	OFFTA	12/3/2001	LETTER	EPA COMMENTS TO THE DRAFT FINAL PRGS, MARINE SEDIMENT	EPA
4-CD1	430	N7397	C-NAVY-01 1522W	OFFTA	12/5/2001	LETTER	Tt RESPONSE TO COMMENTS, DRAFT FINAL SEDIMENT PRGS	TTNUS
4-CD1	429	N7397	C-NAVY-12-01 1542W	OFFTA	12/21/2001	LETTER	ADDITIONAL Tt RESPONSE TO COMMENTS	TTNUS
4-CD1	428	N7397	60942	OFFTA	3/5/2002	LETTER	RIDEM COMMENTS, DRAFT FINAL PRGS, MARINE SEDIMENT	RIDEM
4-CD1	427	N7397	C-NAVY-03-02 1560W	OFFTA	3/27/2002	LETTER	RESPONSE TO COMMENTS, DRAFT FINAL SEDIMENT PRGS	TTNUS
4-CD1	402	N7397	67479	OFFTA		REPORT	FINAL PRGs - MARINE SEDIMENT PRGS	TTNUS
4-CD1	468	N4152	PUB062101	OFFTA	6/21/2001	LETTER	AQUIDNECK ISLAND CITIZENS ADVISORY BOARD LTR ON DRAFT FS	AICAB
4-CD1	408	N7538	W5201240DF	OFFTA	3/1/2002	REPORT	DRAFT FINAL FS - FOR SOIL AND MARINE SEDIMENT	TTNUS
4-CD1	401	N7538	60961	OFFTA	4/4/2002	LETTER	NOAA COMMENTS TO THE DRAFT FINAL FS	NOAA
4-CD1	406	N7538	C-NAVY-04-02 1563W	OFFTA	4/5/2002	REPORT	SUPPLEMENTAL INFORMATION FOR FS (APPENDIX D)	TTNUS
4-CD1	492	N4152	60951	OFFTA	4/9/2002	E-MAIL	RESPONSES TO COMMENTS FROM RIDEM, CONF CALL 4/4/02	TTNUS
4-CD1	387	N7538	62038	OFFTA	4/25/2002	LETTER	EPA COMMENTS TO THE DRAFT FINAL FS	EPA
4-CD1	386	N7538	62044	OFFTA	4/26/2002	LETTER	RIDEM COMMENTS TO THE DRAFT FINAL FS	RIDEM
4-CD1	426	N4152	C-NAVY-06-02 1567W	OFFTA	6/5/2002	LETTER	SUMMARY OF DISCUSSION - HABITATS VS. DREDGING ACTIONS	TTNUS
4-CD1	385	N7538	C-NAVY-06-02 1570	OFFTA	6/13/2002	LETTER	RESPONSE TO COMMENTS, DRAFT FINAL FS	TTNUS
4-CD1	425	N4152	61976	OFFTA	6/17/2002	LETTER	EPA COMMENTS ON NOTES FROM DREDGING OPTIONS (OFFTA)	EPA
4-CD1	384	N7538	61990	OFFTA	7/11/2002	LETTER	ADDITIONAL EPA COMMENTS, DRAFT FINAL FS	EPA
4-CD1	400	N7538	61984	OFFTA	8/28/2002	LETTER	NAVY RESPONSE TO COMMENTS, DRAFT FINAL FS	NAVY
4-CD1	407	N4152	W5201240F	OFFTA	9/1/2002	REPORT	FINAL FEASIBILITY STUDY	TTNUS
4-CD1	405	N4152	62580	OFFTA	9/24/2002	LETTER	NOAA COMMENTS TO THE FINAL FS	NOAA
4-CD2	394	N4152	62576	OFFTA	10/8/2002	LETTER	EPA COMMENTS (DOESN'T ACCEPT FINAL FS)	EPA
4-CD2	518	N4152	W5201254D	OFFTA	10/24/2001	PLAN	DRAFT WORK PLAN - SEDIMENT PRE-DESIGN INVESTIGATION AND ADDENDA FOR GROUNDWATER SAMPLING AND PHASE 2 SEDIMENT INVESTIGATIONS	TTNUS
4-CD2	404	N4152	59211	OFFTA	11/5/2001	LETTER	EPA COMMENTS ON THE DRAFT WORK PLAN FOR SEDIMENT PDI	EPA
4-CD2	403	N4152	59255	OFFTA	11/8/2001	LETTER	EPA RESPONSE TO COMMENTS ON THE WORK PLAN FOR SEDIMENT PDI	EPA
4-CD2	485	N4152	W5202265D	OFFTA	2/1/2002	REPORT	DRAFT TECHNICAL MEMORANDUM - SEDIMENT PRE-DESIGN INVESTIGATION	TTNUS

NAVAL STATION NEWPORT
ADMINISTRATIVE RECORD FILE - SITE 09

AR Sect.	ID No	JOB No.	Doc. No.	Site	Date	Doc. Type	Description	Author
4-CD2	398	N4152	62033	OFFTA	3/4/2002	LETTER	NOAA COMMENTS ON THE SEDIMENT PREDESIGN INVESTIGATION	NOAA
4-CD2	397	N4152	60960	OFFTA	4/8/2002	LETTER	EPA COMMENTS ON THE DRAFT SEDIMENT PREDESIGN INVESTIGATION	EPA
4-CD2	396	N4152	C-NAVY-05-02 1566	OFFTA	5/15/2002	LETTER	RESPONSE TO COMMENTS, DRAFT SEDIMENT PDI REPORT	TTNUS
4-CD2	395	N4152	62123	OFFTA	6/10/2002	LETTER	ADDITIONAL EPA COMMENTS ON THE DRAFT SEDIMENT PDI REPORT	EPA
4-CD2	409	N4152	W5202275D	OFFTA	9/27/2002	REPORT	DRAFT PHASE II SEDIMENT PRE-DESIGN INVESTIGATION	TTNUS
4-CD2	393	N4152	62575	OFFTA	10/8/2002	LETTER	EPA COMMENTS ON THE DRAFT PHASE II PDI REPORT	EPA
4-CD2	392	N4152	64629	OFFTA	11/15/2002	LETTER	RIDEM COMMENTS ON THE DRAFT PHASE II PDI REPORT	RIDEM
4-CD2	498	N4152	68612	OFFTA	1/30/2004	REPORT	EPA REPORT ON SEDIMENT SAMPLING CONDUCTED BY EPA, SITES 09 AND 17	EPA
4-CD2	412	N7538	W5201257D	OFFTA	12/1/2001	REPORT	DRAFT GROUNDWATER RISK EVALUATION	TTNUS
4-CD2	445	N7538	62106	OFFTA	1/17/2002	LETTER	EPA COMMENTS TO THE DRAFT GW RISK EVALUATION	EPA
4-CD2	421	N7538	C-NAVY-03-02 1554	OFFTA	3/1/2002	LETTER	RESPONSE TO COMMENTS, DRAFT GW RISK EVALUATION	TTNUS
4-CD2	399	N7538	W5201257DF	OFFTA	3/1/2002	REPORT	DRAFT FINAL GROUNDWATER RISK EVALUATION	TTNUS
4-CD2	490	N4152	C-NAVY-09-02 1578W	OFFTA	9/5/2002	PLAN	DRAFT PROPOSED REMEDIAL ACTION PLAN	NAVY
4-CD2	489	N4152	67476	OFFTA	10/7/2002	LETTER	RIDEM COMMENTS ON THE DRAFT PRAP	RIDEM
4-CD2	391	N4152	62577	OFFTA	10/8/2002	LETTER	EPA COMMENTS ON THE DRAFT PRAP	EPA
4-CD2	438	N4152	C-NAVY-11-02 1598W	OFFTA	11/4/2002	LETTER	RESPONSE TO COMMENTS ON THE DRAFT PRAP	TTNUS
4-CD2	437	N4152	64610	OFFTA	11/18/2002	LETTER	RAB COMMENTS ON THE DRAFT PRAP	RAB
4-CD2	436	N4152	64603	OFFTA	12/12/2002	LETTER	NAVY RESPONSE TO COMMENTS ON THE DRAFT PRAP	NAVY
4-CD2	435	N4152	64597	OFFTA	12/12/2002	LETTER	EPA RESPONSE TO COMMENTS	EPA
4-CD2	390	N4152	67477	OFFTA	6/1/2003	PUBLIC NOTICE	DRAFT FACT SHEET, SOIL REMOVAL	NAVY
4-CD2	420	N4152	67410	OFFTA	6/9/2003	PUBLIC NOTICE	EPA - PUBLIC INVOLVEMENT STATEMENT	EPA
4-CD2	389	N4152	67478	OFFTA	6/10/2003	LETTER	EPA COMMENTS DRAFT FACT SHEET, SOIL REMOVAL	EPA
4-CD2	388	N4152	67407	OFFTA	6/19/2003	LETTER	RIDEM COMMENTS, DRAFT FACT SHEET SOIL REMOVAL	RIDEM
4-CD2	419	N4152	C-NAVY-07-03-1635W	OFFTA	7/8/2003	LETTER	RESPONSE TO COMMENTS, DRAFT FACT SHEET, SOIL REMOVAL	TTNUS
4-CD2	491	N4152	C-NAVY-07-03-1634W	OFFTA	7/8/2003	PUBLIC NOTICE	FINAL FACT SHEET, SOIL REMOVAL	TTNUS
4-CD2	418	N4152	67411	OFFTA	7/9/2003	PUBLIC NOTICE	PUBLIC STATEMENT	RAB
4-CD2	417	N4152	C-NAVY-11-03-1673W	OFFTA	11/12/2003	PUBLIC NOTICE	RESPONSIVENESS SUMMARY	TTNUS

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4-CD2	433	N4152	C-NAVY-01-04 1685W	OFFTA	1/29/2004	LETTER	SUMMARY OF DISCUSSION - NEXT STEP AT OFFTA	TTNUS
4-CD2	444	N7538	W5203290D	OFFTA	11/1/2003	PLAN	DRAFT WORK PLAN - SOIL PRE-DESIGN INVESTIGATION	TTNUS
4-CD2	443	N7538	67417	OFFTA	12/8/2003	LETTER	EPA COMMENTS, SOIL PDI WORK PLAN	EPA
4-CD2	442	N7538	67434	OFFTA	1/9/2004	LETTER	RIDEM COMMENTS, SOIL PDI WORK PLAN	RIDEM
4-CD2	410	N4152	W52043303D	OFFTA	1/1/2004	REPORT	DRAFT MOUND SUMMARY REPORT	TTNUS
4-CD2	411	N4152	W52043303DF	OFFTA	2/1/2004	REPORT	DRAFT FINAL MOUND SUMMARY REPORT	TTNUS
4-CD2	441	N7538	67435	OFFTA	3/9/2004	LETTER	NAVY RESPONSE TO COMMENTS, SOIL PDI WORK PLAN	NAVY
4-CD2	448	N4152	W5204308D	OFFTA	7/15/2004	REPORT	DRAFT SOIL PRE-DESIGN INVESTIGATION	TTNUS
4-CD2	447	N4152	67427	OFFTA	8/16/2004	LETTER	EPA COMMENTS ON THE DRAFT SOIL PDI REPORT	EPA
4-CD2	446	N4152	67422	OFFTA	9/2/2004	LETTER	RIDEM COMMENTS ON THE DRAFT SOIL PDI REPORT	RIDEM
4-CD2	413	N4152	67470	OFFTA	10/1/2004	LETTER	NAVY RESPONSE TO COMMENTS, DRAFT WORK PLAN, SED AND GW MON	NAVY
4-CD2	424	N4152	W5204314D	OFFTA	6/30/2004	REPORT	DRAFT ACTION MEMORANDUM - MOUND REMOVAL	TTNUS
4-CD2	423	N4152	67448	OFFTA	8/5/2004	LETTER	EPA COMMENTS TO THE DRAFT ACTION MEMO	EPA
4-CD2	422	N4152	C-NAVY-08-04 1739W	OFFTA	8/12/2004	LETTER	RESPONSE TO COMMENTS TO THE DRAFT ACTION MEMO	NAVY
4-CD2	488	N4152	W5204314F	OFFTA	8/13/2004	REPORT	FINAL ACTION MEMORANDUM, MOUND REMOVAL	NAVY
4-CD2	440	N4152	67441	OFFTA	7/30/2004	LETTER	EPA COMMENTS TO MOUND REMOVAL WORK PLAN	EPA
4-CD2	439	N4152	67426	OFFTA	8/12/2004	LETTER	NAVY RESPONSE TO EPA CORRESP 7/30/04	NAVY
4-CD2	434	N4152	W5203293D	OFFTA	6/30/2004	PLAN	DRAFT WORK PLAN - SEDIMENT AND GROUNDWATER MONITORING	TTNUS
4-CD2	416	N4152	C-NAVY-07-04 1726W	OFFTA	7/9/2004	PLAN	REVISION PAGES FOR DRAFT WORK PLAN	TTNUS
4-CD2	415	N4152	67447	OFFTA	8/5/2004	LETTER	EPA COMMENTS ON THE DRAFT WORK PLAN FOR SEDIMENT AND GW MON	EPA
4-CD2	414	N4152	67424	OFFTA	9/2/2004	LETTER	RIDEM COMMENTS ON THE DRAFT WORK PLAN, SED AND GW MON	RIDEM
4	00536	4152	W5204308F	OFFTA	4/29/2005	REPORT	FINAL SOIL PREDESIGN INVESTIGATION REPORT	TtNUS
4	00537	4152		OFFTA	12/23/2004	LETTER	CONSTRUCTABILITY REVIEW AND RESPONSE TO COMMENTS ON DRAFT SOIL PDI REPORT	NAVY
4	00538	1611		OFFTA	1/11/2005	LETTER	RESIDUAL RISK CALCULATIONS FOR SOIL REMOVAL ACTIONS	NAVY
4	00539	1611		OFFTA	1/25/2005	LETTER	EPA COMMENTS ON NAVY CORRESP 12/23/04	USEPA
4	00540	1611		OFFTA	2/8/2005	EMAIL	EPA COMMENTS ON NAVY CORRESP 1/11/05	USEPA
4	00541	1611		OFFTA	2/9/2005	MINUTES	FINAL MINUTES FROM CONFERENCE CALL 1/13/05	NAVY
4	00542	1611		OFFTA	2/10/2005	LETTER	RIDEM COMMENTS ON NAVY CORRESP 1/11/05	RIDEM

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4	00543	1611		OFFTA	2/17/2005	EMAIL	MINUTES FROM MEETING 2/3/05, RA SCHEDULE AND AGENDA FOR NEXT CONF CALL	NAVY
4	00544	1611		OFFTA	2/11/2005	EMAIL	RESPONSE TO QUESTIONS ON RISK ISSUES (RIDEM 2/10/05) AND FROM MEETING 2/3/05	NAVY
4	00545	1611		OFFTA	2/22/2005	LETTER	EPA COMMENTS TO NAVY CORRESP. 12/23/04	USEPA
4	00546	1611		OFFTA	2/25/2005	MINUTES	DRAFT MINUTES FROM MEETING 2/22/06	NAVY
4	00547	1611		OFFTA	2/28/2005	LETTER	RIDEM COMMENTS ON NAVY CORRESP 2/11/05 AND 1/11/05	RIDEM
4	00548	1611		OFFTA	3/7/2005	LETTER	EPA COMMETNS TO MINUTES OF MEETING 2/22/05	USEPA
4	00549	1611		OFFTA	3/9/2005	EMAIL	RIDEM AGREEMENT TO EXCAVATE SOIL	RIDEM
4	00550	1611	C-NAVY-03-05-1826W	OFFTA	3/16/2005	LETTER	SUPPLEMENTAL SOIL INVESTIGATION WORK PLAN	TtNUS
4	00551	1611		OFFTA	3/23/2005	LETTER	EPA COMMENTS ON THE SUPPLEMENTAL SOIL INVESTIGATION WORK PLAN	USEPA
4	00552	1611		OFFTA	3/23/2005	LETTER	RIDEM COMMENTS ON THE SUPPLEMENTAL SOIL INVESTIGATION WORK PLAN	RIDEM
4	00553	1611		OFFTA	3/28/2005	LETTER	RESPONSE TO COMMENTS ON THE SUPPLEMENTAL SOIL INVESTIGATION WORK PLAN	NAVY
4	00554	1611		OFFTA	3/30/2005	EMAIL	EMAIL STRING RESOLVING BORING LOCATIONS FOR SUPPLEMENTAL SOIL INVESTIGATION WORK PLAN	USEPA
4	00555	1611		OFFTA	3/30/2005	LETTER	RIDEM COMMENTS ON LOCATIONS FOR SOIL BORINGS	RIDEM
4	00556	1611		OFFTA	4/5/2005	LETTER	EPA COMMENTS ON THE 30% DESIGN FOR SOIL REMOVAL AT OFFTA	USEPA
4	00557	1611		OFFTA	4/22/2005	LETTER	CLOSURE ON CORRESPONDENCES 1/25, 2/22, 2/28, 3/7, AND MEETING MINUTES 1/13, 2/3, AND 2/22/05	NAVY
4	00558	1611		OFFTA	5/16/2005	LETTER	COMMENTS TO MINUTES IN CORRESPONDENCE DATED 4/22/05	USEPA
4	00559	1611		OFFTA	5/16/2005	LETTER	COMMENTS TO CORRESP. DATED 4/22/05 REGARDING THE CONSTRUCTABILITY REVIEW	USEPA
4	00560	1611		OFFTA	5/31/2005	LETTER	EPA COMMENTS TO THE FINAL SOIL PREDESIGN INVESTIGATION REPORT (APRIL 2005)	USEPA
4	00561	1611	W5205357D	OFFTA	8/25/2005	REPORT	DRAFT SUPPLEMENTAL SOIL INVESTIGATION	TtNUS
4	00562	1611		OFFTA	9/19/2005	LETTER	COMMENTS TO SUPPLEMENTAL SOIL INVESTIGATION REPORT	USEPA
4	00563	1611		OFFTA	11/14/2005	LETTER	RESPONSE TO COMMENTS TO SUPPLEMENTAL SOIL INVESTIGATION	NAVY
4	00564	1611	W5205357F	OFFTA	11/30/2005	REPORT	FINAL SUPPLEMENTAL SOIL INVESTIGATION	TtNUS

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4	00565	1611		OFFTA	12/8/2005	EMAIL	EPA CONCURRANCE WITH SUPPLEMENTAL SOIL INVESTIGATION	USEPA
4	00566	1611		OFFTA	11/26/2004	EMAIL	EPA CONCURRENCE WITH SEDIMENT AND GROUNDWATER MONITORING WORK PLAN	USEPA
4	00567	1611	W5205350D	OFFTA	7/27/2005	REPORT	DRAFT SEDIMENT AND GROUNDWATER MONITORING REPORT	TtNUS
4	00568	1611		OFFTA	8/4/2005	LETTER	COMMENTS TO DRAFT SEDIMENT AND GROUNDWATER MONITORING REPORT	NOAA
4	00569	1611		OFFTA	9/7/2005	LETTER	COMMENTS TO DRAFT SEDIMENT AND GROUNDWATER MONITORING REPORT	USEPA
4	00570	1611		OFFTA	9/13/2005	LETTER	COMMENTS TO DRAFT SEDIMENT AND GROUNDWATER MONITORING REPORT	RIDEM
4	00571	1611		OFFTA	12/7/2005	LETTER	RESPONSE TO COMMENTS, DRAFT SEDIMENT AND GROUNDWATER MONITORING REPORT	NAVY
4	00572	1611		OFFTA	11/30/2005	LETTER	COMMENTS ON APPENDIX E OF THE DRAFT SEDIMENT AND GROUNDWATER MONITORING REPORT	RIDEM
4	00573	1611		OFFTA	12/22/2005	LETTER	COMMENTS ON NAVY CORRESP. 12/7/05	USEPA
4	00574	1611		OFFTA	3/13/2006	LETTER	RESPONSE TO ADDITIONAL COMMENTS, DRAFT SEDIMENT AND GROUNDWATER MONITORING REPORT	NAVY
4	00575	1611	W5205350F	OFFTA	3/20/2006	REPORT	FINAL SEDIMENT AND GROUNDWATER MONITORING REPORT	TtNUS
4	00576			OFFTA	12/8/2005	LETTER	RESPONSE TO COMMENTS ON DRAFT MOUND REMOVAL CLOSEOUT REPORT	NAVY
4	00577			OFFTA	12/15/2005	EMAIL	EPA CONCURRANCE WITH MOUND REMOVAL CLOSEOUT REPORT	USEPA
4	00578	5339	C-NAVY-03-06-2082W	OFFTA	3/17/2006	REPORT	CONCEPTUAL SITE MODEL FOR OFFTA	TtNUS
4	00579	5339		OFFTA	4/13/2006	SLIDES	CLEANUP REVIEW TIGER TEAM RECOMMENDATIONS FOR THE OFFTA SITE, PRESENTATION SLIDES	NAVY
4	00580	5339		OFFTA	9/7/2005	LETTER	OFFTA CLARIFICATION ON FUTURE LAND USE	NAVY
4	00581	5339		OFFTA	5/25/2006	MINUTES	DRAFT MEETING MINUTES FROM THE TIGER TEAM REVIEW MEETING 4/13/06	NAVY

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4-CD2	352	NA	N061603	SWOS	6/16/2003	LETTER	NAVY LETTER RE: NAVY PROPOSAL FOR NEW STUDY AREA	NAVY
4-CD2	351	N5152	67403	SWOS	6/24/2003	LETTER	EPA LETTER RE: NAVY PROPOSAL FOR NEW STUDY AREA	EPA
4-CD2	499	NA	RI062703	SWOS	6/27/2003	LETTER	RIDEM LETTER RE: NAVY PROPOSAL FOR NEW STUDY AREA	RIDEM
4-CD2	334	N5152	W5204306D	SWOS	9/1/2004	PLAN	DRAFT WORK PLAN - FOCUSED SITE INSPECTION	TTNUS
4-CD2	333	N5152	67471	SWOS	9/30/2004	LETTER	EPA COMMENTS, DRAFT SI WORK PLAN	EPA
4-CD2	332	N5152	67492	SWOS	10/15/2004	LETTER	RIDEM COMMENTS DRAFT SI WORK PLAN	RIDEM
4	00582			SWOS	3/18/2003	PLAN	WORK PLAN FOR TEST PIT EXCAVATION AT SWOS PARKING LOT	FOSTER WHEELER
4	00583			SWOS	3/18/2003	PLAN	HASP FOR TEST PIT EXCAVATION AT SWOS PARKING LOT	FOSTER WHEELER
4	00584			SWOS	7/21/2003	PLAN	SAMPLING PLAN TO SUPPORT RISK ASSESSMENT FOR WORKER EXPOSURE	FOSTER WHEELER
4	00585			SWOS	3/12/2004	REPORT	OCCUPATIONAL EXPOSURE ASSESSMENT FOR CONSTRUCTION AT SWOS SITE	FOSTER WHEELER
4	00586	5152		SWOS	11/24/2004	LETTER	RESPONSE TO COMMENTS DRAFT FOCUSED SI WORK PLAN, SWOS	NAVY
4	00587	5152		SWOS	12/15/2004	EMAIL	ACCEPTANCE OF RESPONSE TO COMMENTS	USEPA
4	00588	5152		SWOS	1/14/2005	LETTER	COMMENTS ON NAVY CORRESP 11/24/04	RIDEM
4	00589	5152		SWOS	2/9/2005	LETTER	RESPONSE TO COMMENTS, DRAFT FOCUSED SI WORK PLAN, SWOS	NAVY
4	00590	5152	W5204306F	SWOS	2/10/2005	WORK PLAN	REVISED WORK PLAN, FOCUSED SITE INVESTIGATION, SWOS	TtNUS
4	00591	5339	W5205348D	SWOS	10/25/2005	REPORT	DRAFT FOCUSED SITE INVESTIGATION REPORT, SWOS	TtNUS
4	00592	5339		SWOS	11/17/2005	LETTER	COMMENTS TO THE DRAFT SI REPORT	USEPA
4	00593	5339		SWOS	12/9/2005	LETTER	COMMENTS TO THE DRAFT SI REPORT	RIDEM
4	00594	5339		SWOS	3/3/2006	LETTER	RESPONSE TO COMMENTS, DRAFT FOCUSED SI REPORT, SWOS	NAVY
4	00595	5339	W5205348DF	SWOS	3/23/2006	REPORT	DRAFT FINAL FOCUSED SITE INVESTIGATION REPORT, SWOS	TtNUS
4	00596	5339		SWOS	3/24/2006	LETTER	COMMENTS ON NAVY CORRESP. 3/3/06	RIDEM
4	00597	5339		SWOS	4/12/2006	EMAIL	EPA CONCURRENCE ON DRAFT FINAL REPORT	USEPA

Attachment C
Responsiveness Summary on Public and Other Comments to the Fact Sheet

RESPONSIVENESS SUMMARY
FACT SHEET FOR SOIL REMOVAL ACTION
OLD FIREFIGHTING TRAINING AREA
NAVSTA NEWPORT, NEWPORT, RHODE ISLAND

The purpose of the responsiveness summary is to document the Navy's responses to the comments and questions raised during the public comment period on the proposed removal action plan. The Navy considered all of the comments summarized in this section before selecting the remedy described in this Action Memorandum.

BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

In 1996 the Navy established a citizen's advisory committee called a Restoration Advisory Board (RAB) to assist the Navy in addressing Installation Restoration (IR) program sites, such as the Old Fire Fighting Training Area (OFFTA). The RAB meets monthly at NAVSTA Newport to discuss planned and ongoing activities at the IR sites on the base. The cleanup alternatives for site soil were discussed at RAB meetings at various times during the development of the Feasibility Study (FS). Input provided by the RAB was considered during development of the FS, the Fact Sheet describing the proposed soil cleanup, and the Action Memorandum.

The FS for the OFFTA site was made available to the public in September and the Fact Sheet describing the proposed soil cleanup was made available in July 2003. They can be found in the information repositories maintained for the site at the Middletown, Newport, and Portsmouth, Rhode Island Public Libraries.

The notice of availability for the Fact Sheet describing the proposed soil cleanup was published in the Newport Daily News and the Providence Journal – East Bay Edition on July 8, 11, and 15, 2003. A public comment period on the proposed cleanup plan lasted from July 16, 2003 to August 15, 2003. An informational open house and meeting was held on July 16, 2003 to present the proposed soil cleanup plan to the public and to solicit comments on the plan. Representatives from the Navy, EPA, and the RIDEM were available at the meeting to discuss the public's questions and concerns about the site. A representative from the Navy was present at the hearing to record the public's formal comments and comment cards were available for people to provide formal written comments.

COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND THE NAVY'S RESPONSE TO THOSE COMMENTS

Formal comments on the proposed cleanup plan were received from eleven individuals or groups during the public comment period. The rest of this section presents the comments received and provides the Navy's responses to those comments.

Name:
Ms. Claudette Weissinger

Comment:
Highly support the offshore and on shore clean up be done at the same time. (for obvious reasons).

Navy's Response:
The Navy believes that the sediment data collected to date are inconclusive in demonstrating that an active remediation of the offshore sediment is warranted. The Navy believes that conducting an agressive offshore sediment clean up would be more harmful to the marine habitat and marine life than taking no action. (There is no identified human health risk from the offshore sediments.) RIDEM and EPA disagree with the Navy's conclusions about the need for active remediation of the sediment, but have agreed to postpone the final offshore decision. The Navy will collect additional offshore data and further evaluate the extent of any additional actions needed for sediment. Rather than delay the soil cleanup until additional data are collected, evaluated and agreement is reached on the appropriate action for sediment, the Navy believes it is in the best interest of the public, and the environment, to move forward with the onshore soil removal action now.

Name:
Mr. Christopher Burnett
President,
Spinblade Energy LLC
Portsmouth, RI

Comment:

Has the Navy considered the merits of installing 2 to 3 wind turbines at the recovered site for the purpose of generating clean, carbon free renewable electric power for the use of Navy Station Newport. Such an initiative could help to take a negative toxic removal into a positive renewable energy projects. The U.S. Navy would not have to pay for such an initiative but could lease 3 locations (approximately 28 feet in diameter) to mount modern 1.5 mw turbines. Based on local onemometer data these turbines could generate 9.0 mwh of power annually. It could generate additional income to the Navy and reduce the base dependence on easily interrupted commercial power.

(The commentor attached) copies of relevant DOD directives on renewable energy. The proposed turbines would not preclude in any way the use of the land for recreational or other purposes. The State of RI can provide subsidy from RI Renewable Funds. Potential income - $50,000 to $75,000 per year for 4.5 mw. Excellent welfare and rec funds. Provide free power for streetlights for the Navy.

Navy's Response:

The installation of wind turbines falls outside the scope and jurisdiction of the Navy's Installation Restoration Program, under which waste site investigation and remediation are performed. The Public Works Officer for NAVSTA Newport is responsible for managing real estate property, and energy initiatives and conservation. The NAVSTA Environmental staff will bring to the attention of the Public Works Officer this concept for his awareness and future considerations on any area of NAVSTA property.

Name:
Ms. Mary Philcox
Aquidneck Island Citizens Advisory Board

Comments:

Soil Cleanup:

1. Storm Drain System – The existing storm drain system has been implicated as a potential source of PAH contaminants either through direct runoff or as a migration pathway. As the existing system is being removed during excavation, this is an opportunity to eliminate one of the variables associated with the sediment contamination. How does the Navy propose to address storm water conveyances and discharges at this site after the soil cleanup is completed?

Navy's Response:

The existing storm drainage system is currently being upgraded to include a contaminant capture system, and other upgrades will be considered as a part of the proposed construction clean-up for the site.

2. Truck Traffic – Request that the Navy minimize the impact of truck traffic on the local community as well as people along the routes to the disposal sites. For example, truck arrival and departure times could be limited to reduce noise and traffic during early morning and late evening hours, loads should be covered and weight restrictions should be observed.

Navy's Response:

The Navy will make efforts to minimize the impacts of truck traffic on the community through the means described above as well as others such as routing trucks to limit travel on small secondary roads to the extent possible. The design document for the soil cleanup will address these issues in detail.

3. The Navy, USEPA, and RIDEM have not yet reached an agreement on the proposed remedy for the sediments. As it is possible that a sediment cleanup could be conducted concurrently with the soil cleanup, this issue should be resolved as soon as possible. What is the process for reaching agreement? What type of time frame is anticipated?

Navy's Response:

The Navy is in the process of completing the Draft Work Plan for a supplemental monitoring to collect and evaluate additional data to determine the extent of any remedial actions needed for offshore sediment. USEPA and RIDEM must review and approve the draft work plan before the investigation is conducted. After the work plan is approved, the Navy will conduct the investigation and incorporate its findings into a revised Feasibility Study. USEPA and RIDEM will review the revised FS and provide comments or concurrence. The time frame for reaching agreement is dependent on the length of time it takes to prepare the draft documents, the length of time for all parties to review, comment and agree or reach consensus on each document discussed above. Our goal is to reach agreement on the monitoring work plan during the winter season so that sediment sampling may begin in the spring.

4. The Navy has indicated that it does not believe that there is a significant cost savings if soil removal and sediment removal actions occur concurrently. What is the estimated difference in cost between conducting the soil and sediment removal concurrently versus separately?

Navy's Response:

The costs for performing the soil and the sediment removal actions have been estimated separately, because different equipment is required, and logistics may require one be performed either before or after the other. However, it is believed that some of the administrative costs (contracting actions, project management, etc.) would be shared between the two actions if they were conducted together. Using the estimates recently published, sharing these tasks could result in a cost savings of approximately $58,000. It is also possible that some savings could be realized for waste disposal per ton, if both sediment and soils are removed together; however, this is unknown at this time. Basically if both the soil and sediments removal actions are combined the administrative cost saving is minimal when compared to the overall project cost estimated in the FS.

5. Phase II pre-design sampling at sediment station SD-410 yielded results that were an order of magnitude lower than the results obtained during the Feasibility Study (FS) sampling. The FS sample result was above the preliminary remediation goal (PRG) but the Pre-design sample result was less than the PRG. What method will the Navy use to determine whether the contaminant levels in the sediment are safe if the results cannot be directly compared to the PRG due to variability? Does the Navy have an explanation for the variability in the test results? Does the Navy plan to conduct further studies of the behavior of the contaminants in the sediment? Will additional modeling of sediment stability and other physical, biological and chemical processes be performed? What is the timeframe for any planned studies and will the work be completed prior to the proposed soil removal?

Navy's Response:

The Navy is still evaluating the conditions at the site to determine the extent of any remedial actions needed for offshore sediment. These evaluations include reevaluation of existing data, as well as collection of new data before and after soil removal actions. The variability described above is one factor that contributed to Navy's conclusion that active remediation of the sediments is not warranted. Variability can be related to the nature of ocean sediments (moving with tides and storm events) and with what is known as heterogeneity. The continued monitoring effort will go on through 2004 and 2005 (contingent on work plan approval), while the soil removal is plan in two stages. The first stage is to remove the known soil mounds on site in 2004. For stage one, the exact amount of soil needing removal is evident since it is well known that the soil mounds were created when the original fire fighting training operation were terminated. The larger of the two removal actions the second stage will remove the subsurface soil contamination in 2005. .

6. The Navy has proposed that the sediment be monitored after the soil removal action is completed to see if cleanup goals will eventually be reached as an alternative to concurrent soil and sediment removal. How does the Navy propose to determine whether cleanup goals have been met? What would be the scope of the sampling (frequency, locations, parameters)? What levels/trends would be considered to meet remediation goals?

Navy's Response:

Sediment results from current and past sampling efforts continue to be compared with remediation goals provided in the Feasibility Study Report (September 2002). Additionally, these results are shared with USEPA and RIDEM for continuing discussions on whether these sediments will require removal. The Sediment and Groundwater Monitoring Draft Work Plan soon to be released for this site will address the scope of the sampling efforts. The findings will be used to make a determination of what follow-on actions are necessary.

Name:
Mr. David W. Brown

Comments:

I appreciate the facts sheets, displays, briefings and study reports that the Navy has provided on OFFTA over the past two years. It is good that NSN intends to go ahead with this part of the OFFTA cleanup as soon as possible. But I have the following concerns:

1. In using just the three criteria and choosing Alt. 3 (removal and disposal) over Alt. 2 (removal, treatment, backfill), the Navy has ignored the negative long-term community and area effects ("external social costs").

   The Navy has chosen the cheapest way to meet cleanup standards from the standpoint of its own "out-of-pocket" costs, but it has not included indirect costs to the public, both tangible and

intangible. From the community externalities standpoint, Alt. 3 is likely to be worse than Alt. 2 in at least the following ways:

a) More exposure of people along the truck routes to dust, engine emissions, and noise from hauling more tons of contaminated stuff away.
b) More wear-and-tear on the roads and bridges that the trucks use.
c) Quicker fill-up of the landfills where the stuff is dumped, and needs for our region to find other, more costly ways to dispose of waste sooner.
d) Possible need eventually to clean up more OFFTA material at the dumping sites, if people-intensive land uses there are eventually sought.
e) Possible added human health and ecological risks near the dumping sites from having more OFFTA material there.

The only "social" pluses I can think of for Alt. 3 are that f) more work for local truckers and drivers will be generated and g) by having a few months' quicker access to OFFTA, NSN may generate a few more jobs sooner.

An argument that you have used "standard procedures" won't hold. As good environmental economics and benefit-cost references will tell you, sound comparisons will "internalize" such externalities into the analysis. Or at least, a tradeoff framework should be used to weight the Navy's costs and benefits against these other important society-wide considerations.

To put it another way, I don't think that citizens here want to be party to messing up the life qualities, safety and environment of people elsewhere, just to clean up our own backyard the cheapest way. So I am calling for the above kinds of "external" issues and concerns to be given full consideration by the Navy, regulatory agencies and others involved before choosing Alt. 3.

Navy's Response:

The Navy considers these types of indirect "social" costs to the extent possible in evaluating remedial options. The Navy agrees that the external social cost concerns mentioned above are valid for any removal action project that removes contaminated soil from a site and transports it to a permitted landfill disposal facility, and as such are taken into consideration when doing comparisons. However, fiscal reality dictates that it must also give great weight to the bottom line "out-of-pocket" costs in order to maximize the environmental cleanup benefits across all of the Navy sites. The Navy has a finite budget to divide among the many needed investigation and remediation projects under its jurisdiction. Therefore every extra dollar spent on one project is a dollar diverted from another project. The social costs of alternative 3 identified above must be weighed not simply against the direct and indirect costs of alternative 2, but also against the human and environmental costs of not using the $5,000,000 cost difference to fund the cleanup of another site.

2. Why have the estimated cost and time advantages of Alt. 3 become greater than before?

Earlier drafts of remedial alternatives talked in terms of $8 million for Alt. 3 vs. $12 million for Alt. 2. Now it's $9 million vs. $14 million. And even more striking, while it was formerly 4-6 months vs. 6-8 months, now it's 6 months vs. 2 years. What justified these big comparative changes from earlier estimates?

Navy's Response:

The alternatives and associated estimates provided in the Draft Feasibility Study were revised based on review of the draft document. This is not uncommon, and indeed the purpose of the peer review of the documents, to assure that all the efforts associated with the projects have been properly thought out.

Several factors contributed to the increased cost estimates. Costs for both alternatives increased because the conversion factor for the number of tons per cubic yard of soil to be removed was revised

from approximately 1.2 to 1.5, increasing the estimated tonage to be removed and increasing all costs estimated on unit-tons (transport costs, disposal costs, backfill costs, etc.). Additionally, estimated sampling costs increased for both alternatives because the number of confirmation samples to be collected after excavation was increased, and the frequency of testing soil to be disposed of was increased. For alternative 2, additional costs were included for more post-treatment confirmation analysis, and pilot testing of the treatment process.

The schedules for both Alternatives 2 and 3 were revised to be more complete. Both schedules were revised to include time for mobilization and demobilization, instead of only including the earthmoving operations. The schedule for alternative 2 was revised to include pilot testing efforts, and to increase the time for treatment on site because the treatment time in the draft schedule was judged to be too short to achieve the cleanup goals.

3. If you go ahead with Alt. 3,
   a) Can you demonstrate that the Navy is taking precautions to minimize negative social (community and area) impacts? E.g. why not barge the stuff away instead of trucking it?
   b) If there some social damages (like medical problems from truck pollution or ruined roads), is the Navy prepared to compensate for the damages without hassle or delay?

Navy's Response:

During the design of the soil cleanup, the Navy will evaluate various means of minimizing potential impacts to the surrounding community and environment. Alternate transportation methods, transportation routes, hauling schedules, covered and sealed hauling containers, dust control methods; and air monitoring will be evaluated to develop an implementable, cost effective plan that minimizes negative impacts to the community and environment.

The Navy has conducted remedial actions of this scale at Naval Station Newport and other bases taking appropriate precautions to not damage people's health or the local infrastructure. The Navy anticipates that the proposed cleanup can be carried out in a safe manner and with minimal disruptive activities to the surrounding community. If the Navy causes any damage as a result of the cleanup, the Navy will work with the community to remedy the damage.

4. Re the off-shore sediment, I'm disappointed that the Navy isn't going ahead with the off-shore cleanup now. But it's heartening to learn that the Navy wants to reach agreement with EPA and RIDEM in coming months. What are the remaining issues, who will take the next negotiating step, and when?

Navy's Response:

The Navy does not believe that remedial action is warranted for the offshore sediment because the current data does not consistently show a connection between the contaminants in the sediment and the contaminants on the site. The sediment contaminants appear to be more closely related to urban runoff and storm water pollutants than the oils that are present in the soil at the site. RIDEM and EPA disagree with the Navy's conclusions about the need for active remediation of the sediment, but have agreed to postpone the final offshore decision. The Navy will collect additional offshore data and further evaluate the extent of any additional actions needed for sediment. The Navy is scheduling meetings with the regulators to continue to discuss the technical differences. The next steps are completing and reaching agreement on future monitoring efforts.

5. Re the groundwater, can't the Navy do better than just monitor before/after outflows? Why not make improvements in surface and subsurface drainage for that whole part of the Island as an integral part of the soil cleanup (e.g., drainage from the new "temporary" parking lot on part of OFFTA)?

Navy's Response:

The Navy has installed upgrades including pollutant capture system to the storm drain system that discharges to the north portion of the site. Additional improvements are being considered for the second storm drain system at the site, and would be included in the second stage soil removal action.

Name:
Ms. Nathaya Johnson

Comment:
This is an issue that shouldn't even be talked about anymore! This project should have started and been in the works a long time ago. Now they're talking about more delays? More delays to begin to right the wrong to the environment? Delays such as that tend to contradict the very standards which certain organizations were set up for originally. These organizations were set up to take action, not bog down and delay. That having been said, let me just say that we'd better start the cleanup of this project in order to better the environment.

Navy's Response:
The Navy supports starting the cleanups this fiscal year. With that in mind the Navy scheduled the soil removal action in two stages. The first stage is the soil mound removals in 2004 and the second stage is the removal of the contaminated subsurface soil in 2005.

Name:
Mr. Michael Anderson

Comment:
I say why spend more money on further testing. Enough testing has already been done! They know there are "hot spots". We all know about "hot spots". They won't go away no matter how long we delay this thing, obviously. So waiting any longer is definitely not the answer. Let's let the Navy do what they propose. Their proposal is right and just. Their intent mean this important work will start soon.

Navy's Response:
Your comment has been added to the responsiveness summary, thank you.

Name:
Mr. Erasmo Garcia

Comment:
I think the Navy's ideas about cleaning up this site is definitely a good proposal and the right thing to do rather than waste further time on doing nothing. The longer this is allowed to go on for, the more time is ultimately wasted resulting in the environment being unimproved longer. Let's stop all the red tape and start cleaning up this land!

Navy's Response:
Your comment has been added to the responsiveness summary, thank you.

Name:
Mr. John Anderson

Comment:
The Navy should be allowed to begin a cleanup project without much further ado. These considerations have been going on way too long and too much government money is being wasted as it is! The Navy's proposal would mean an environmental improvement ultimately, therefore, there should be no entity getting in the way of that mission. There is no good sound reason not to begin hands-on work to rectify this problem that has apparently been allowed to go on long enough!

Navy's Response:
Your comment has been added to the responsiveness summary, thank you.

Name:
Mr. William Weikert

Comment:
Plain and simple. Let's begin the work and solve any problems that may come up as we go along. We know what we're in for here. Every project has potential problems unforeseen that may arise. That's no excuse to not clean up the environment. We as taxpayers deserve to see our hard-earned tax money spent on solving problems, cleaning up the planet, and good causes as such. So let's get to it and do it. Wasting our money on red-taped delays is not the way to solve issues. We need to take action, begin the work, get it done and move on to the many other important issues that concern us all in our daily lives.

Navy's Response:
The Navy supports starting the cleanups this fiscal year. With that in mind the Navy scheduled the soil removal action in two stages. The first stage is the soil mound removals in 2004 and the second stage is the removal of the contaminated subsurface soil in 2005.

Name:
Mr. Manual Marquis

Comment:
I am well aware of this proposal through my attendance at the rab meetings. I am very much in favor of the Navy's proposal for remediation to commence as soon as possible.

Navy's Response:
Your comment has been added to the responsiveness summary, thank you.

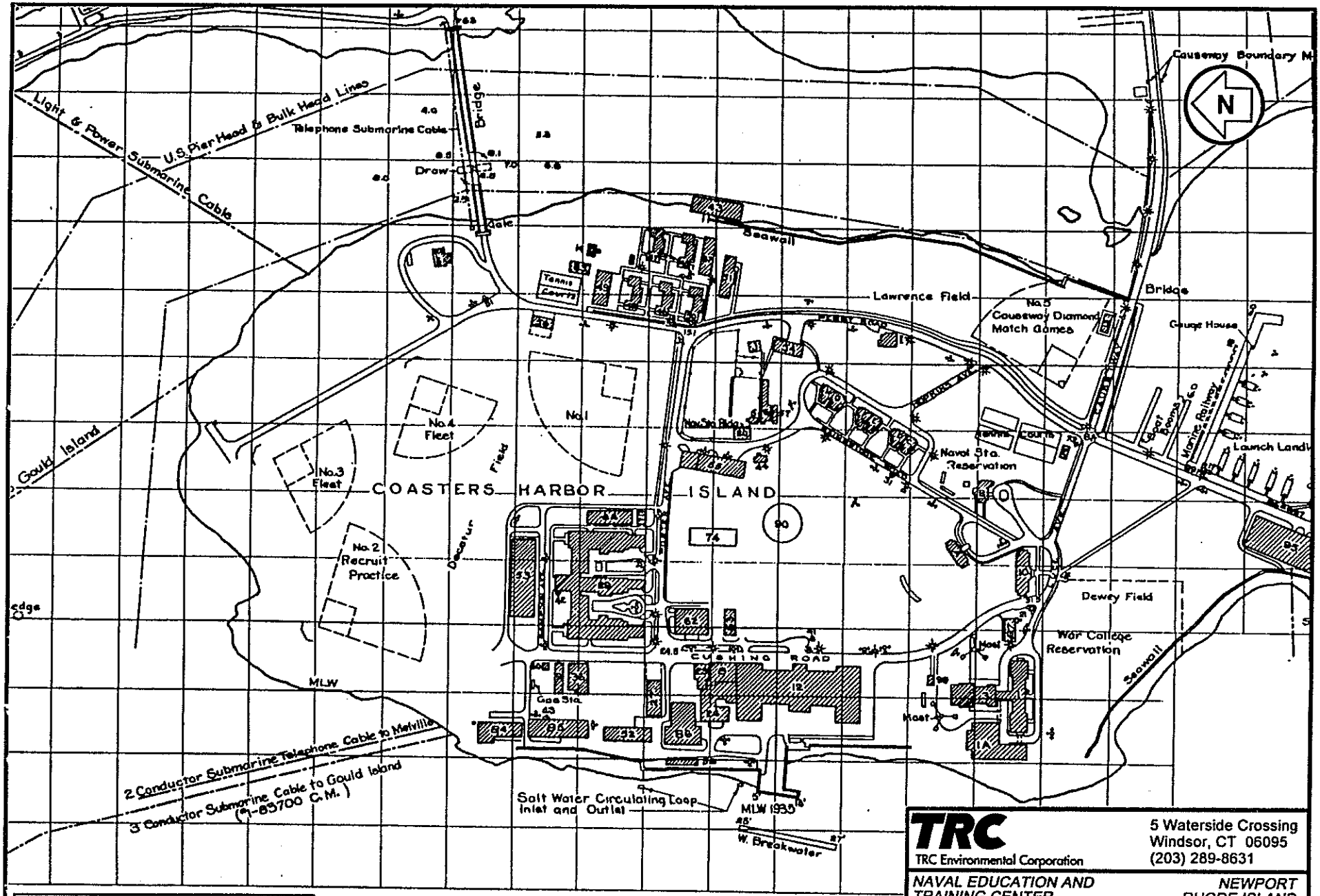
Name:
Mr. Victor Peabody

Comment:
The way I see it is, why wait any longer, why spend more money than we have to, why procrastinate the cleanup of this problem? Let's stop dilly-dallying and start taking action. No action is not better than taking physical steps to rectify the situation here. We could begin the work and then, if we ran into a problem, solve the problems as we go along instead of anticipating a problem that may not exist therefore delaying the important work in the meantime.

Navy's Response:
Your comment has been added to the responsiveness summary, thank you.

APPENDIX B

HISTORIC DRAWINGS, COASTERS HARBOR ISLAND



TRC
TRC Environmental Corporation
5 Waterside Crossing
Windsor, CT 06095
(203) 289-8631

NAVAL EDUCATION AND TRAINING CENTER — NEWPORT RHODE ISLAND

NAVY CONDITIONS MAP JUNE 30, 1939

Date: 8/94

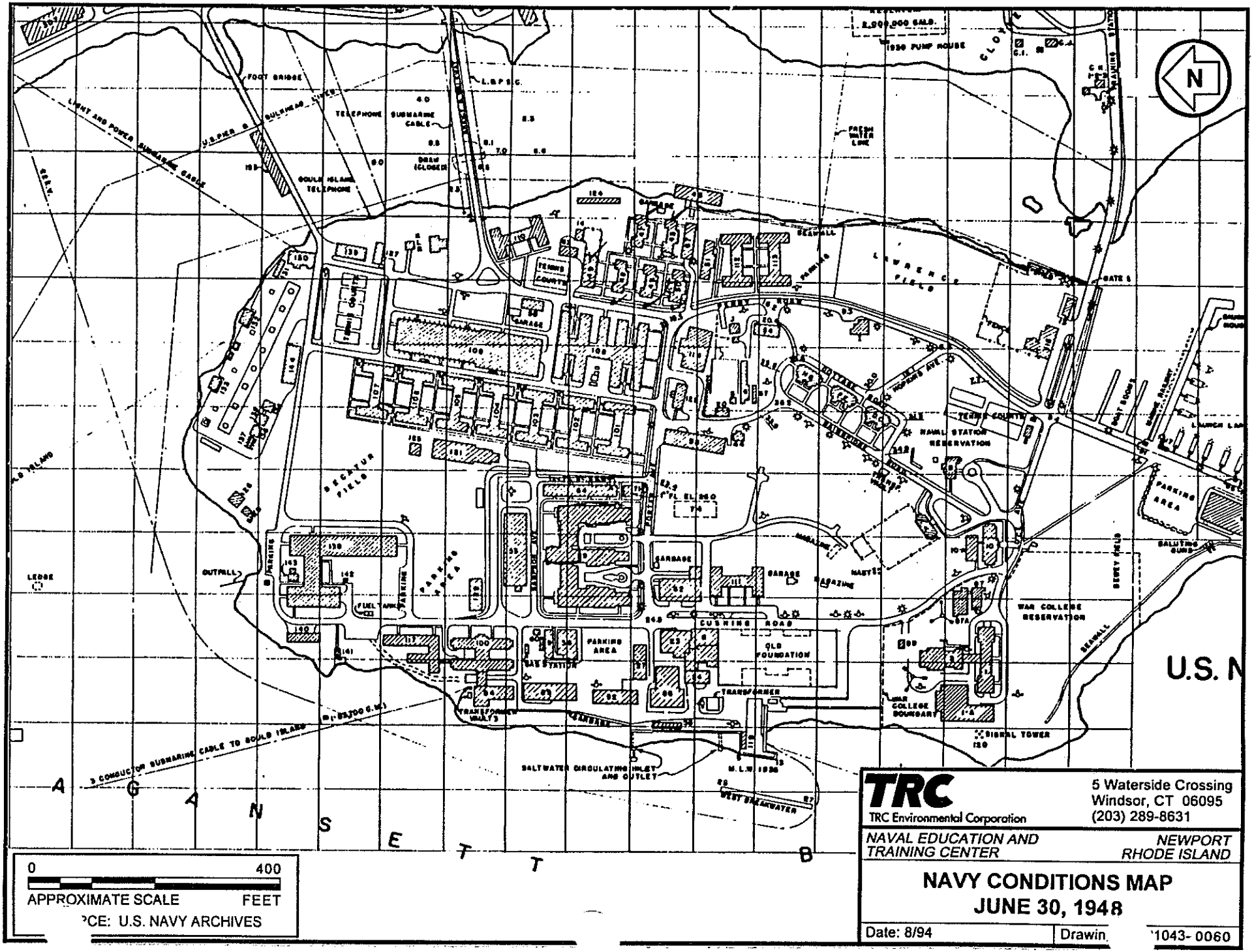
Drawing No. 01043-0060

June 30, 1948

INDEX OF STRUCTURES

Number	Activity	Use
126	F.T.C.	Gas Instruction Building
129	F.T.C.	Diesel Building
130	F.T.C.	FF School (Admin. Building)
131	F.T.C.	Hose House
132	F.T.C.	Carrier Compartment
133	F.T.C.	Carrier Compartment
134	F.T.C.	Simulated Ship Structure
135	F.T.C.	Simulated Ship Structure
136	F.T.C.	Simulated Ship Structure
137	F.T.C.	Simulated Ship Structure
139	F.T.C.	Simulated Ship Structure
144	F.T.C.	Wash & Dressing Rooms

Source: Index of Structures, U.S. Navy Archives, NETC, Newport, Rhode Island.



0 400
APPROXIMATE SCALE FEET

SOURCE: U.S. NAVY ARCHIVES

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NAVAL EDUCATION AND TRAINING CENTER — NEWPORT RHODE ISLAND

NAVY CONDITIONS MAP JUNE 30, 1948

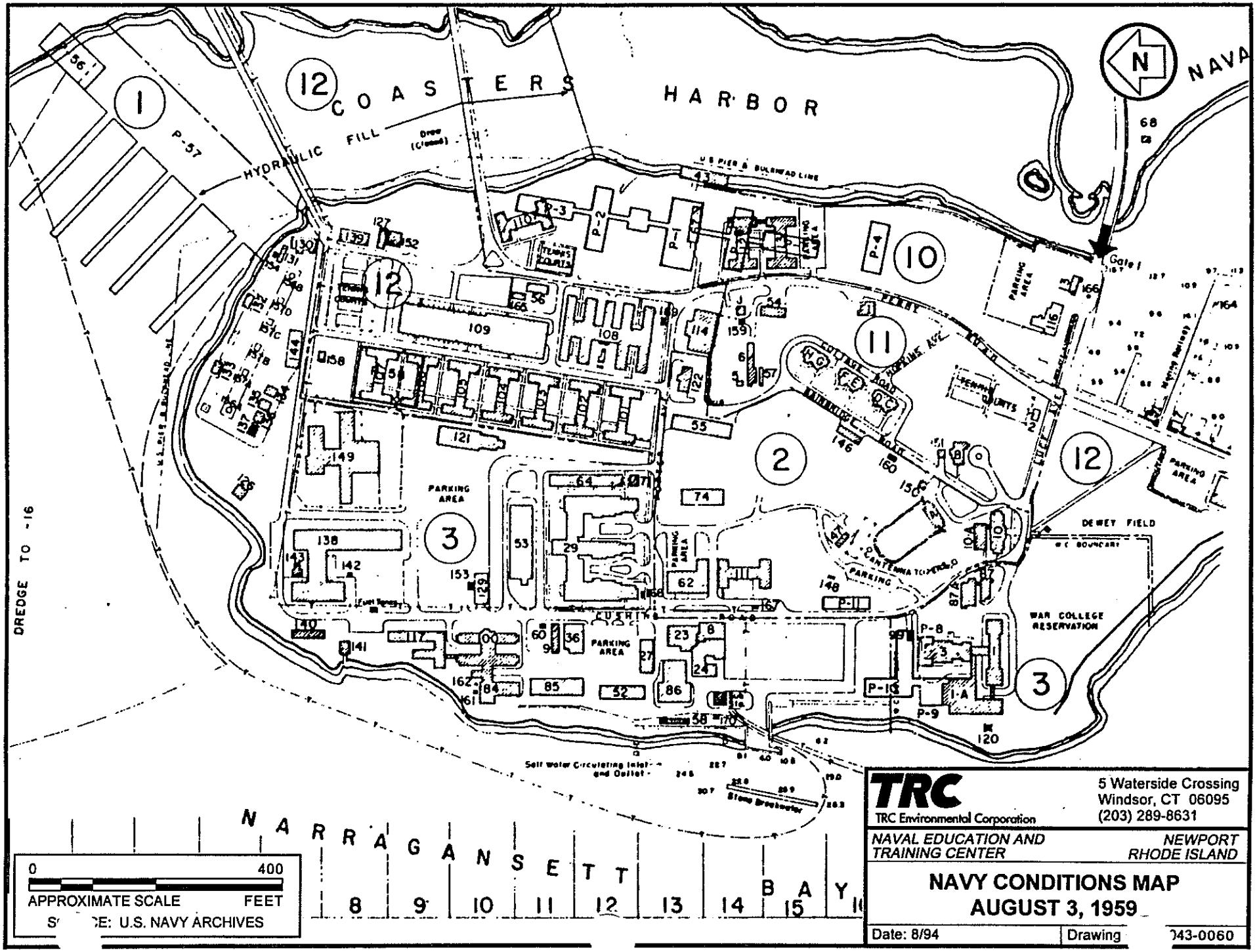
Date: 8/94 | Drawin | 1043- 0060

August 31, 1959

INDEX OF STRUCTURES

Number	Activity	Use
126	F.T.C.	Classroom
127	Nav. Sta.	B.Z. Trainer Building
129	Nav. Sta.	Garage
130	F.T.C.	Office
131	F.T.C.	Hose Storage
132	F.T.C.	Carrier Compartment
133	F.T.C.	Carrier Compartment
134	F.T.C.	Simulated Ship Structure
135	F.T.C.	Simulated Ship Structure
136	F.T.C.	Simulated Ship Structure
137	F.T.C.	Simulated Ship Structure
139	F.T.C.	Classroom
144	F.T.C.	Dressing & Wash Rooms
152	Nav. Sta.	Classroom for B.Z. Trainer
154	F.T.C.	Classroom
156-A	F.T.C.	Round Open Fire Tank
156-B	F.T.C.	Round Open Fire Tank
157-A	F.T.C.	Rectangular Open Fire Tank
157-B	F.T.C.	Rectangular Open Fire Tank
157-C	F.T.C.	Rectangular Open Fire Tank
157-D	F.T.C.	Rectangular Open Fire Tank
158	P.W.C.	Sewage Pumping Station

Source: Index of Structures, U.S. Navy Archives, NETC, Newport, Rhode Island.


COASTERS HARBOR
HYDRAULIC FILL
P-57
DREDGE TO -16
PARKING AREA
DEWEY FIELD
WAR COLLEGE RESERVATION
NARRAGANSETT BAY
0
400
APPROXIMATE SCALE
FEET
SOURCE: U.S. NAVY ARCHIVES
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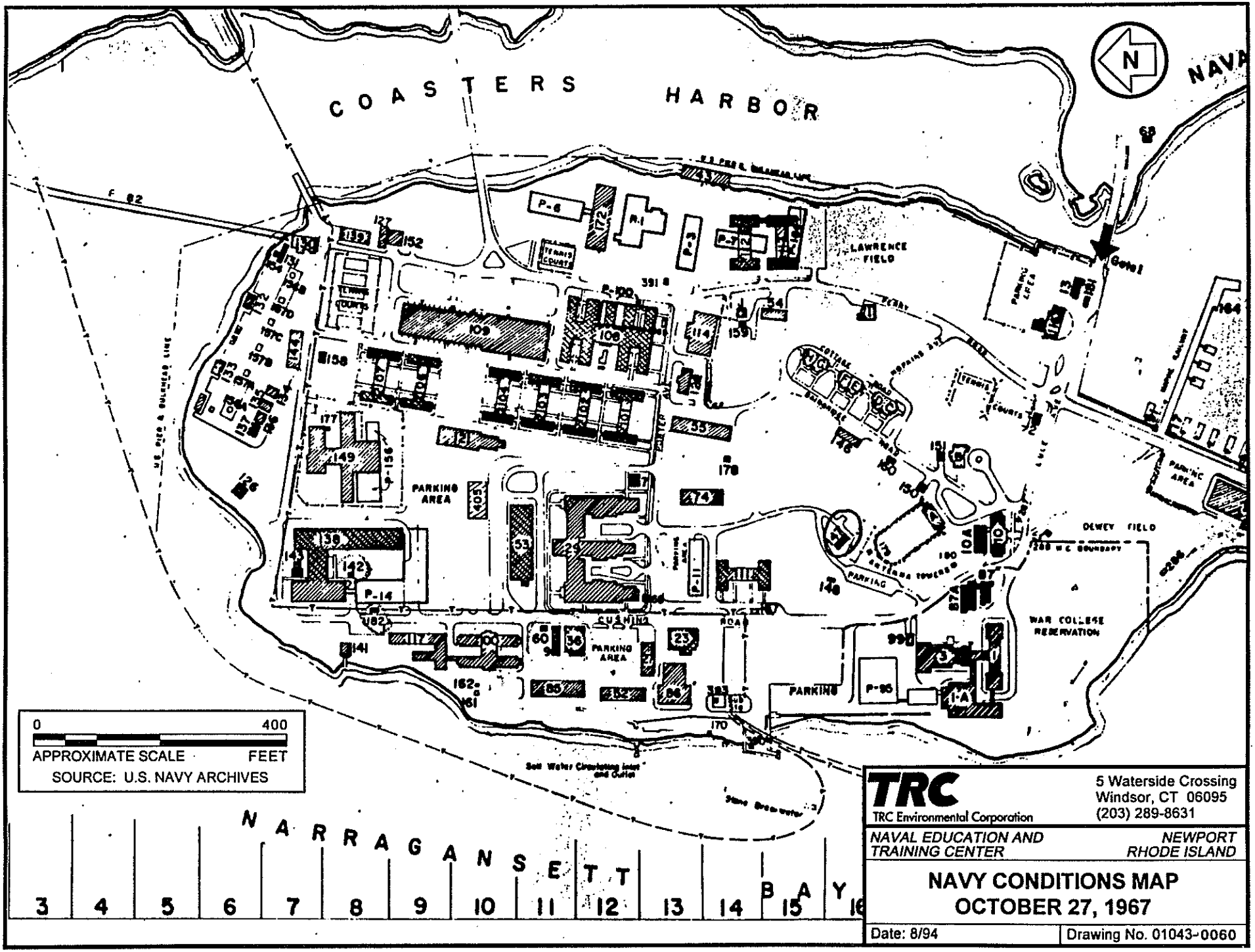
NAVAL EDUCATION AND TRAINING CENTER
NEWPORT RHODE ISLAND
NAVY CONDITIONS MAP
AUGUST 3, 1959
Date: 8/94
Drawing
043-0060

October 27, 1967

INDEX OF STRUCTURES

Number	Activity	Use
126	Nav. Sta.	Storage
127	N.S.C.	B.Z. Trainer Building
130	F.T.C.	Office
131	F.T.C.	Hose Storage
132	F.T.C.	Carrier Compartment
133	F.T.C.	Carrier Compartment
134	F.T.C.	Simulated Ship Structure
135	F.T.C.	Simulated Ship Structure
136	F.T.C.	Simulated Ship Structure
137	F.T.C.	Simulated Ship Structure
139	F.T.C.	Classroom
144	F.T.C.	Dressing & Wash Rooms
152	O.C.S.	B.Z. Trainer Repair Shop
154	F.T.C.	Classroom
156-A	F.T.C.	Round Open Fire Tank
156-B	F.T.C.	Round Open Fire Tank
157-A	F.T.C.	Rectangular Open Fire Tank
157-B	F.T.C.	Rectangular Open Fire Tank
157-C	F.T.C.	Rectangular Open Fire Tank
157-D	F.T.C.	Rectangular Open Fire Tank
158	P.W.C.	Sewage Pumping Station

Source: Index of Structures, U.S. Navy Archives, NETC, Newport, Rhode Island.



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NAVAL EDUCATION AND TRAINING CENTER

NEWPORT RHODE ISLAND

NAVY CONDITIONS MAP OCTOBER 27, 1967

Date: 8/94

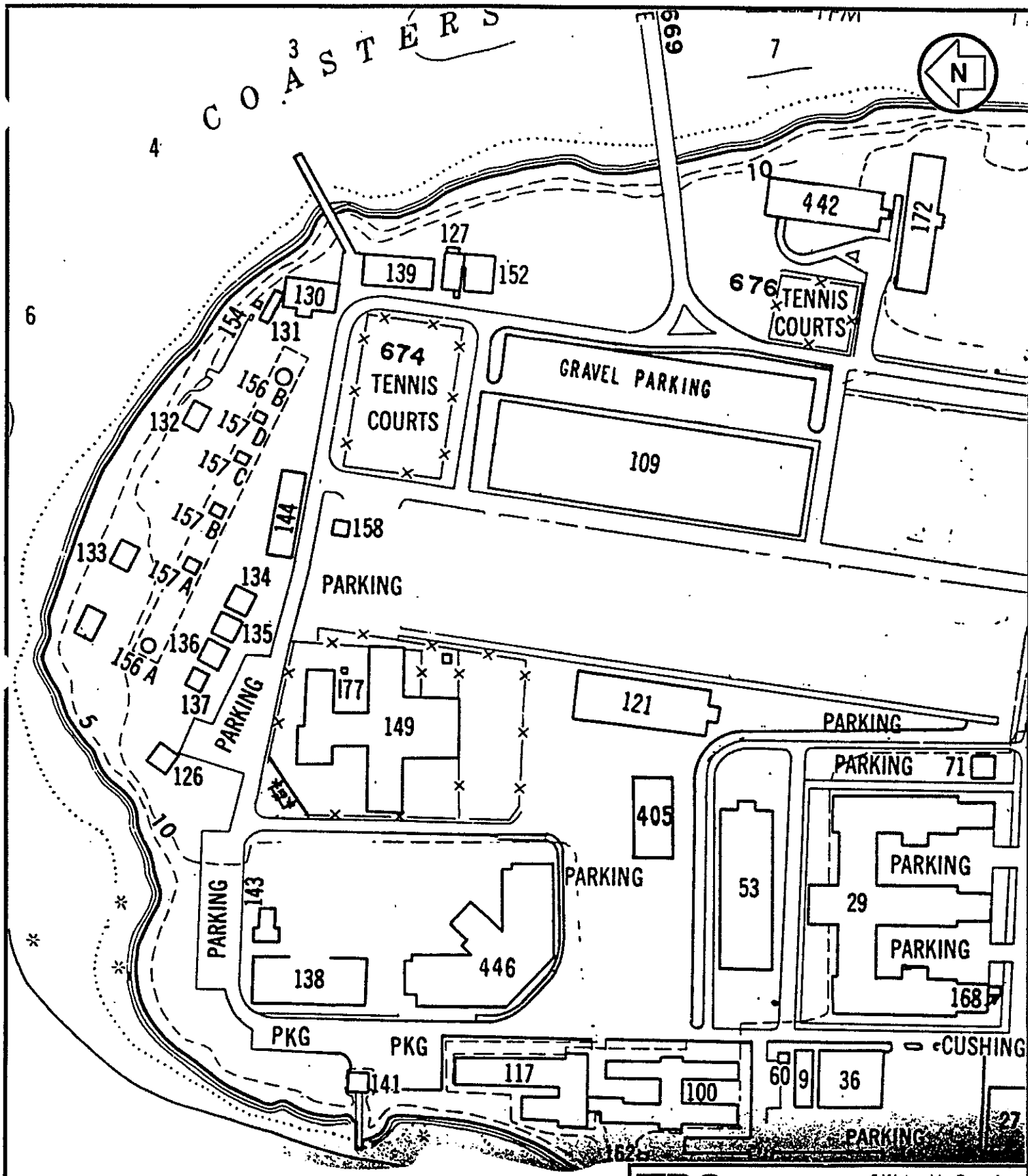
Drawing No. 01043-0060

July 31, 1969

INDEX OF STRUCTURES

Number	Activity	Use
126	F.T.C.	Storehouse
130	F.T.C.	2,000 GPM Fire Protection Pumping Station
131	F.T.C.	Equipment Storehous
132	F.T.C.	Training Mock Up
133	F.T.C.	Training Mock Up (Inactive)
134	F.T.C.	Training Mock Up (Inactive)
135	F.T.C.	Training Mock Up
136	F.T.C.	Training Mock Up (Inactive)
137	F.T.C.	Training Mock Up (Inactive)
144	F.T.C.	EM Locker Room
154	F.T.C.	Equipment Storehouse
156-A	F.T.C.	Training Mock Up (Inactive)
156-B	F.T.C.	Training Mock Up (Inactive)
157-A	F.T.C.	Training Mock Up
157-B	F.T.C.	Training Mock Up
1157-C	F.T.C.	Training Mock Up
157-D	F.T.C.	Training Mock Up

Source: Index of Structures, U.S.Navy Archives, NETC, Newport, Rhode Island.



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APPROXIMATE SCALE . FEET
SOURCE: U.S. NAVY ARCHIVES

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NAVAL EDUCATION AND TRAINING CENTER — NEWPORT RHODE ISLAND

NAVY CONDITIONS MAP JULY 31, 1969

Date: 8/94 | Drawing No. 01043-0060

COASTER'S HARBOR

NARRAGANSETT BAY

TENNIS COURTS
TENNIS COURTS
GARAGE
PARKING
SEAWALL
PERRY ROAD
COTTAGE ROAD
BAINBRIDGE ROAD
CUSHING ROAD
SAMPSON AVE.
PORTER AVE.
HALL
SIMS
PIPE WELL
BREAKWATER

MH 26 MH 25 MH 24 MH 23 MH 22 MH 21 MH 20 MH 19 MH 18 MH 17 MH 16 MH 15 MH 14 MH 13 MH 12 MH 11 MH 10 MH 9 MH 8 MH 7 MH 6 MH 5 MH 4 MH 3 MH 2 MH 1 MH 40 MH 31 MH 30 MH 29 MH 28 MH 27

OIL TANK
GAS TANK
OIL TANK FARM
DIL TANK
OIL TANK
GAS TANK
OIL TANK FARM
OIL TANK

2-6" OIL LINES
1-3½" H.P. STEAM RETURN
1-4" SLUDGE
FOR DETAIL SEE P.W.D. 9500-102

FOR DETAIL SEE P.W.D. 9500-102

MATCH LINE SEE SHEET NO. 2 OF 2

LEGEND

- EXISTING BUILDING OR STRUCTURE
- EXISTING ROAD OR PAVED AREA
- FENCE
- SHORE LINE

SYMBOLS

- OIL LINE
- STEAM RETURN
- LIVE STEAM LINE
- VALVE
- EXPANSION LOOP STEAM SUPPLY
- HP HIGH PRESSURE
- CONDENSATE PUMP
- MANHOLE
- EXPANSION LOOP STEAM RETURN

0 100 200 300 400 500
GRAPHIC SCALE IN FEET

APPROVED FOR SHORE STATION DEVELOPMENT BOARD
DATE
APPROVED FOR BUREAU OF YARDS & DOCKS
DATE FOR CHIEF OF BUREAU
APPROVED FOR SPONSOR BUREAU OR OFFICE
DATE
APPROVED FOR LOCAL DEVELOPMENT BOARD
DATE

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

DEPARTMENT OF THE NAVY BUREAU OF YARDS & DOCKS
U S NAVAL STATION NEWPORT, R. I.
COASTER'S HARBOR ISLAND NEWPORT, R. I.

DRAWN BY Christopherson DATE 12-8-53
CONTRACT NOy 77748
CHECKED
DESIGN SUPT.
P.W.O.

MASTER SHORE STATION DEVELOPMENT PLAN
PART IV SECTION 6
AREA DEVELOPMENT PLAN
STEAM & RETURN
FUEL OIL

APPROVED 12/9/53 DATE
COMMANDING OFFICER

SUBMITTED 12/9/53 DATE
STATION DEVELOPMENT BOARD

SCALE 1" = 100'-0"
SHEET 1 OF 2
Y.B.D. DWG. NO. 63787

APPROVED FOR SHORE STATION DEVELOPMENT BOARD

DATE

APPROVED FOR BUREAU OF YARDS & DOCKS

DATE FOR CHIEF OF BUREAU

APPROVED FOR SPONSOR BUREAU OR OFFICE

DATE

APPROVED FOR LOCAL DEVELOPMENT BOARD

DATE

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

DEPARTMENT OF THE NAVY BUREAU OF YARDS & DOCKS
U S NAVAL STATION NEWPORT, R. I.
COASTER'S HARBOR ISLAND NEWPORT, R. I.

DRAWN BY M. Traficante	DATE 12-9-53
CONTRACT NOy77748	
CHECKED	12/7/53
DESIGN SUPT.	7 Dec 53
P.W.O.	

MASTER SHORE STATION DEVELOPMENT PLAN

PART IV SECTION 6

AREA DEVELOPMENT PLAN

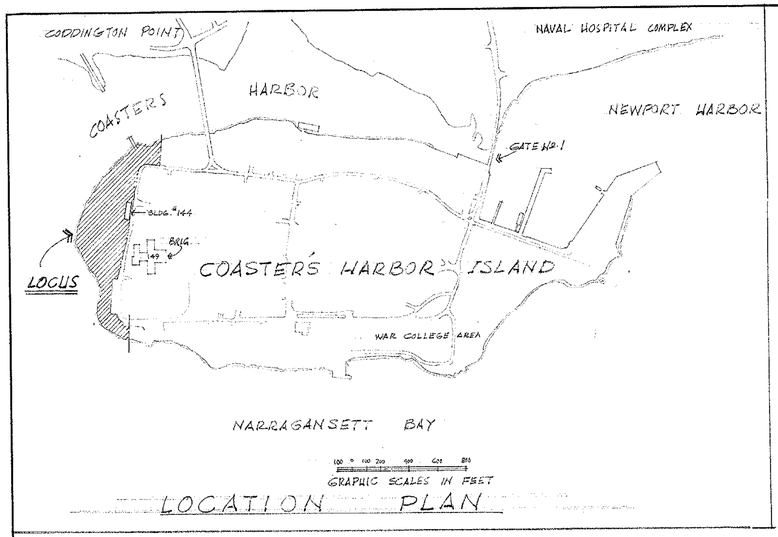
SANITARY & STORM SEWERS

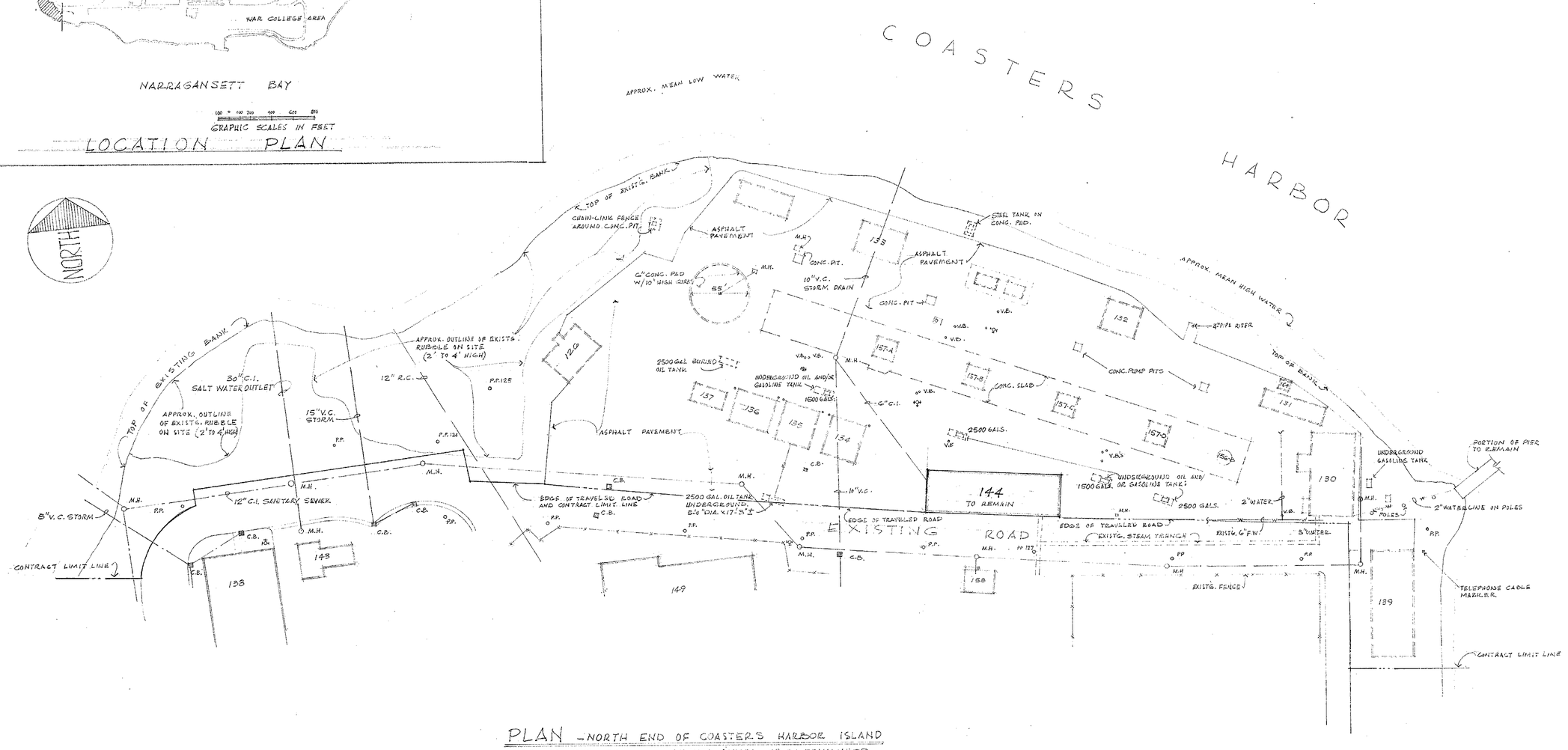
APPROVED 12/9/53 DATE
J B Cooney
COMMANDING OFFICER

SUBMITTED 12/9/53 DATE
J B Cooney
STATION DEVELOPMENT BOARD

SCALE 1" = 100'-0"
SHEET 1 OF 2
Y&D DWG. NO. 637862

REVISION			
SYM	ZONE	DESCRIPTION	DATE	APPROVED





PLAN — NORTH END OF COASTER'S HARBOR ISLAND
SITE OF FORMER FIREFIGHTING SCHOOL TO BE DEMOLISHED.
— SCALE: 1" = 40' —

DEMOLISH ALL BUILDINGS & STRUCTURES, EXCEPT BLDG NO. 144, NORTH OF CONTRACT LIMIT LINE TO WATER'S EDGE AND DEVELOPE SITE AS INDICATED AND SPECIFIED ON NAVFAC DWGS. NO. 2013349 AND 2013350.

GRAPHIC SCALES
1" = 40'
50' 0' 50' 100' 150'

NETC DWG. NO.	19573-202
DES. A.W. CHAPLIN	
DR. A.W. CHAPLIN	
DIV. DIR.	
DEPT. HEAD	
APPROVED	DATE 11/21/74
SATISFACTORY TO	
DATE	11/21/74

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND

NAVAL EDUCATION AND TRAINING CENTER
NEWPORT, RHODE ISLAND

DEMOLITION of FIREFIGHTING SCHOOL
EXISTING SITE CONDITIONS
PLAN

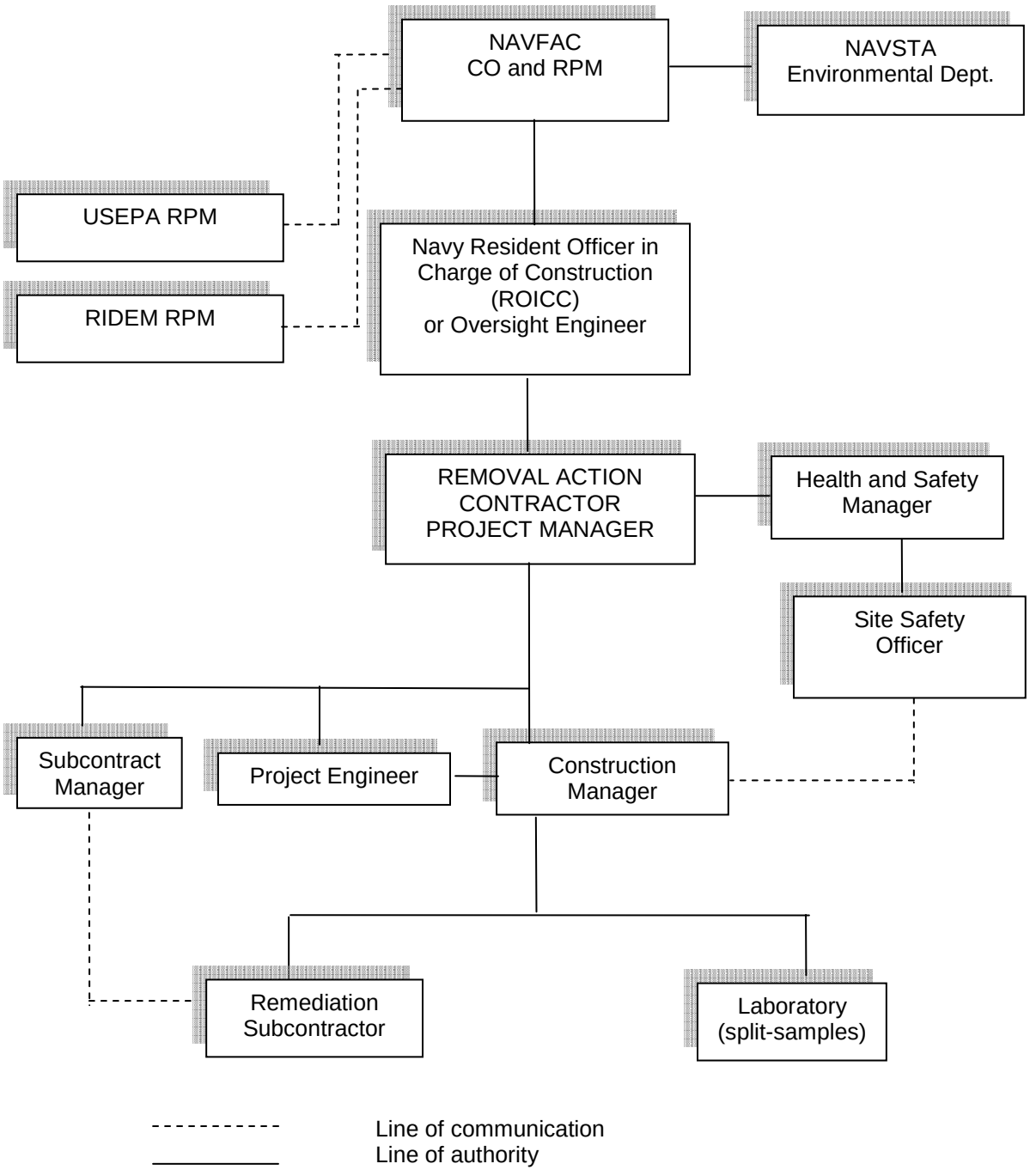
SIZE	CODE IDENT NO.	NAVFAC DRAWING NO.
F	80091	2013348

SCALE: AS NOTED — CONSTR. CONTR. NO. N62472-75-C-1731 — SPEC. 04-75-1731 — SHEET 1 OF 3

APPENDIX C

PROJECT ORGANIZATION CHART

PROJECT ORGANIZATIONAL CHART
REMOVAL ACTION WORK PLAN
OLD FIRE FIGHTING TRAINING AREA
NAVSTA NEWPORT, NEWPORT, RHODE ISLAND



APPENDIX D

PROPOSED MEETING AGENDAS

AGENDA
PRE-CONSTRUCTION MEETING
OFFTA REMOVAL ACTION

1. Designation of responsible personnel.
2. List of proposed subcontractors with name, address, phone number and work to be performed.
3. Names, addresses and qualifications of proposed testing contractors.
4. Scheduling and critical work sequencing.
5. Coordination with other contracts and/or work.
6. Schedule of Values
7. Progress schedule.
8. Meetings
9. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal requests, change orders, and Subcontract closeout procedures.
10. Use of premises by RA Contractor and SUBCONTRACTOR.
11. Construction facilities and controls provided by SUBCONTRACTOR.
12. Construction facilities and controls provided by RA Contractor.
13. Temporary utilities provided by SUBCONTRACTOR.
14. Field engineering.
15. Major equipment deliveries and priorities.
16. List of products proposed for installation (in accordance with Section 01300)
17. Submittal of list of products proposed for substitution.
18. Project inspection.
19. Labor Requirements.
20. Requirements of railroads, highway departments, other agencies and utility companies.
21. Rights-of-way and easements.
22. Winter maintenance.
23. Security and housekeeping procedures.
24. Payments to SUBCONTRACTOR.
25. Procedures for testing.

26. Procedures for maintaining documents.

27. Inspection and acceptance of equipment put in service during construction period.

28. Substantial completion of Work.

29. Final completion of Work.

AGENDA
PROGRESS MEETING
OFFTA REMOVAL ACTION

Time: _____
Location: _____

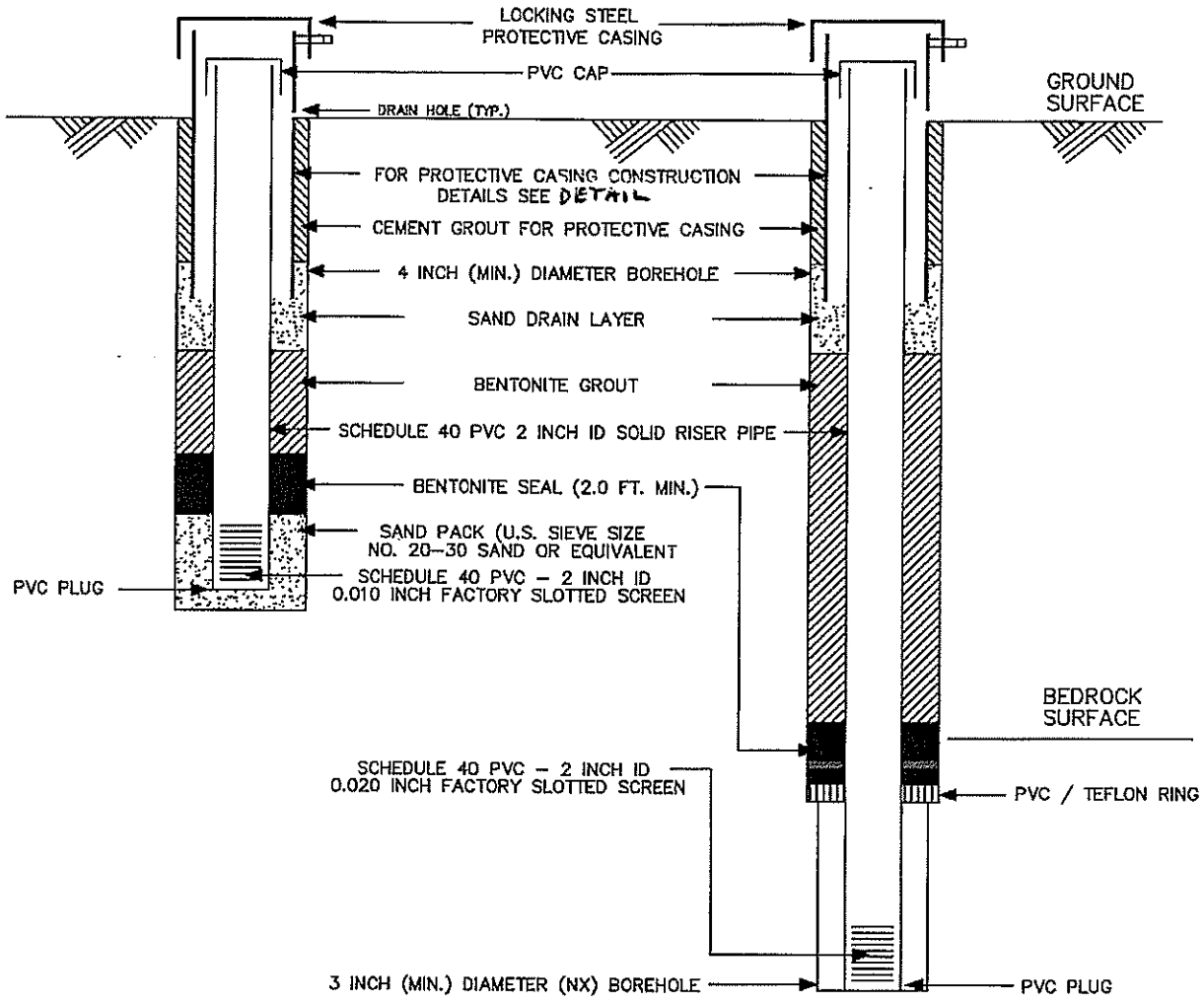
1. Introductions
2. Review of Previous Meeting Summary Notes
3. Review of Action Items (from previous meeting)
4. Summary of Work (since previous meeting)
5. Work Scheduled for this week and following week
6. Construction Schedule Status
7. Health and Safety Issues
8. Quality Assurance and Quality Control (QA/QC)
9. Submittals Status Deliveries Schedule
10. Work Hours
11. Sampling Activities and Analytical Data
12. Other Business
13. Action Items
14. Next Meeting Date/Time

APPENDIX E

MONITORING WELL CONSTRUCTION SPECIFICATION

OVERBURDEN
WELL / PIEZOMETER

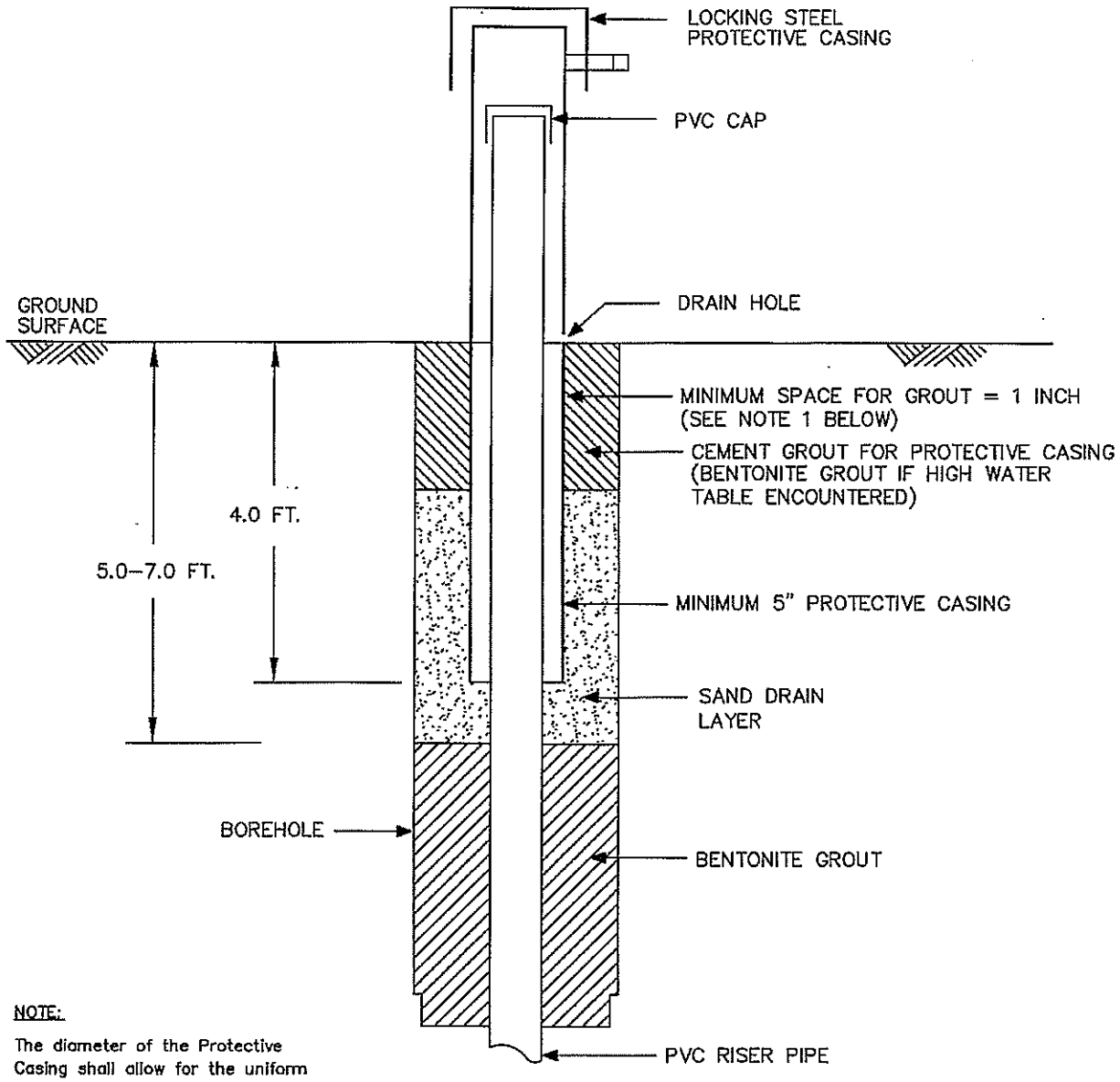
BEDROCK
WELL / PIEZOMETER



OVERBURDEN & BEDROCK WELL CONSTRUCTION DETAILS			E-1
REPLACEMENT WELLS, SITE 09			
NAVAL STATION NEWPORT - NEWPORT, RI			
DRAWN BY:	D.W. MACDOUGALL	REV.:	0
CHECKED BY:	S. PARKER	DATE:	DECEMBER 14, 2006
SCALE:	NONE	ACAD NAME:	DWG\112G00065\0120\FIG_D-1.DWG

TETRA TECH NUS, INC.
55 Jonspin Road Wilmington, MA 01887
(978)658-7899

PROTECTIVE CASING



NOTE:

The diameter of the Protective Casing shall allow for the uniform placement of a minimum of 1.0 inch of cement grout or volclay grout around the casing. The inside diameter shall be of sufficient size to allow easy removal of the PVC cap. This may require that the upper five feet of some borings have a diameter larger than the specified minimum.

PROTECTIVE CASING CONSTRUCTION DETAIL			E-2
REPLACEMENT WELLS AT SITE 09			
NAVAL STATION NEWPORT – NEWPORT, RHODE ISLAND			
DRAWN BY:	D.W. MACDOUGALL	REV.:	0
CHECKED BY:	S. PARKER	DATE:	DECEMBER 14, 2006
SCALE:	NONE	ACAD NAME:	DWG\00632\0210\FIG_D-2.DWG

TETRA TECH NUS, INC.
55 Jonspin Road Wilmington, MA 01887
(978)658-7899

APPENDIX F

EXCAVATION VOLUME CALCULATIONS

TETRA TECH NUS, INC.

CALCULATION WORKSHEET

CLIENT: NAVFAC CTO 65 JOB NO.

SUBJECT: Foundation and Soil Excavation Areas and Volumes
Removal Action Phase 2
OFFTA, NAVSTA Newport

BY: JF CKD BY: DATE: 5/21/2007

Area	Manhole Structure 1	Drainage Pipe 1	Drainage Pipe 2	Concrete Apron	Area A	Test Exc.	Total	Foun-dations	Total w/Foun-dations
Total Excavation (CY)	126	260	260	286	1,016	616	**2,563**	624	**3,187**
Excavation (CY)									
Soil	92	260	260	86	1016	616	2,330	80	2,410
Concrete	11			200			211	544	755
Water	11						11		
Void	11						11		
	126	260	260	286	1016	616	**2,563**	624	**3165**
Disposal Volumes, CY (no expansion)									
Soil	46	130	130	43	508	123	980	272	1,252
Rubble	11			200			211	80	291
Water	11						11		
	68	130	130	243	508	123	**1,202**	352	**1,543**
Disposal Volumes, CY (with expansion)									
Soil (10% expansion)	51	143	143	47	559	136	1,078	299	1,377
Rubble (40% expansion)	16			280			296	112	408
Water	11						11		11
	78	143	143	327	559	136	**1,385**	411	**1,796**
Disposal Quantities (tons)									
Soil	69	195	195	65	762	185	1,470	408	1,878
Rubble	23			405			428	162	590
Water	120						120		120
	212	195	195	470	762	185	**2,018**	570	**2,588**
Fill Quantities (CY)									
1.5-inch crushed stone	4	11	11	0	93	6	125	0	125
Excavated soil returned	46	130	130	43	254	493	1,096	272	1,368
Additional fill soil imported									
Topsoil (6 inches)	14	27	27	72	125	74	338	72	410
Common fill	62	92	92	172	544	43	1,004	280	1,284
	126	260	260	286	1016	616	**2,563**	624	**3,187**
Filter fabric (SY)	13	33	33	0	278	18	376	0	376

TETRA TECH NUS, INC. **CALCULATION WORKSHEET**

CLIENT: NAVFAC CTO 65 JOB NO.

SUBJECT: Foundation and Soil Excavation Areas and Volumes
Removal Action Phase 2
OFFTA, NAVSTA Newport
Manhole Structure 1

BY: JF CKD BY: BFS DATE: 5/21/2007

OBJECTIVE: Estimate the soil and material volumes to be generated by removal of Manhole Structure 1. Only structure concrete top is visible and manhole has not been opened to inspect interior. Assume 1) excavation depth is to top of groundwater table; 2) structure is constructed of poured reinforced concrete and half full of water. Dimensions are assumed; original construction plans not available. 3) 50% of the soil will be designated for off-site disposal (TPH exceeds 2,500 mg/kg).

GIVEN:

Structure interior length (assumed)	10.0	ft
Structure interior width (assumed)	10.0	ft
Structure interior depth (assumed)	6.0	ft
Sidewall thickness	0.5	ft
Bottom thickness	1.0	ft
Top thickness	0.5	ft
Ground surface elevation	10.0	ft
Groundwater table elevation	3.0	ft
Proposed excavation depth (D)	8	ft
Excavation side slope	1H:1V	
Concrete density	150	lb/cf

ANALYSIS: Calculate excavation volume (V_E)

Determine excavation area at bottom (A_B)

Bottom excavation length (L_B)	11.0	ft	
Bottom excavation width (W_B)	11.0	ft	
A_B	121	sq ft	(11' x 11')

Determine excavation area at surface (A_S)

Calculate excavation length at surface

bottom length	11.0	ft
sidewall horizontal length	8.0	ft
sidewall horizontal length	8.0	ft
Surface excavation length (L_S)	27.0	ft
Surface excavation width (W_S)	27.0	ft

A_S	729	sq ft	(27' x 27')

$V_E = ((A_B + A_S)/2) \times D$

A_B	121	sf	
A_S	729	sf	
D	8	ft	
V_E	3,400	cf	({[121+729]/2} x 8')
	126	CY	(3,400 cf / 27 cf/CY)

Calculate water volume					
Length (inside)			10	ft	
Width (inside)			10	ft	
Depth (inside)			6	ft	
Structure volume			600	cf	(10' x 10' x 6')
			22.2	CY	(600 cf/27 cf/CY)
Water volume (1/2 volume)			300	cf	(300 cf x 0.5)
			11.1	CY	(300 cf/27 cf/CY)
			2,246	gallons	(300 cf x 7.485 gal/cf)
Calculate structure volume					
Length			11	ft	
Width			11	ft	
Depth			7.5	ft	
Structure volume			908	cf	(11' x 11' x 7.5')
			34	CY	(908 cf/27 cf/CY)
Calculate reinforced concrete volume (V_C)					
Walls	10	ft			
	6	ft			
	0.5	ft			
	30	cf			
	4	each			
			120	cf	(10' x 6' x 0.5' x 4)
Top	11.0	ft			
	11.0	ft			
	0.5	ft			
			61	cf	(11' x 11' x 0.5')
Bottom	11.0	ft			
	11.0	ft			
	1.0	ft			
			121	cf	(11' x 11' x 1.0')
	V_C		302	cf	
			11.2	CY	(302 cf/27 cf/CY)
			45,225	lb	(302 cf x 150 lb/cf)
			22.6	tons	(45,225 lb/2,000 lb/ton)
Calculate soil volume					
Soil volume (V_{SO})					
$V_{SO} = V_E - V_S$					
	V_E		126	CY	
	V_S		(34)	CY	
	V_{SO}		92	CY	
Disposal soil quantity			46	CY	(92 cf x 0.05)
			69	tons	(46 CY x 1.5 ton/CY)

SUMMARY: Total Excavation Volume 125.9 CY

Concrete	11 CY	8.9%	
Water	11 CY	8.8%	
Void	11 CY	8.8%	
Soil	92 CY	73.3%	
	126 CY	99.8%	

Disposal Quantities	Weight	Volume	
Rubble (40% expansion)	22.6 tons	16 CY	(11.2 CY x 1.4)
Soil (10% expansion)	69 tons	51 CY	(46 CY x 1.1)
Water		2,246 gallons	
Manhole lid and frame	1 each		

Fill Material Required

Total volume required		126.0 CY	
Area bottom		121.0 sf	
Assume 50 % of excavated soil RCRA D T&D			
Assume 1 foot layer stone stabilization layer			
Assume filter fabric over stone			
Source			
1.5-inch crushed stone		4 CY	([121 sf x 1] / 27 cf/CY)
Excavated soil returned		46 CY	(92.3 CY x 0.5)
Additional fill soil imported		75 CY	(126 CY - (46 + 4) CY)
Topsoil (6 inches)	14 CY		({121 sf x 0.5'}/27 cf/CY)
Common fill	62 CY		(75 CY - 14 CY)
Filter fabric		13 SY	(121 sf/9 sf/SY)

TETRA TECH NUS, INC. **CALCULATION WORKSHEET**

CLIENT: NAVFAC CTO 65 JOB NO.

SUBJECT: Foundation and Soil Excavation Areas and Volumes
Removal Action Phase 2
OFFTA, NAVSTA Newport
Drainage Pipe 1

BY: CKD BY: DATE: 5/21/2007

OBJECTIVE: Estimate the volume of soil and material to be excavated by removal of Drainage Pipe 1 if excavation depth is to top of groundwater table. Assume 1) 50-foot segment of pipe removed by excavation; 2) excavation is terminated 20 feet from top of beach embankment slope. Remaining downgradient pipe (approximately 50 feet) will be removed by pulling from embankment; 3) 50% of the soil will be designated for off-site disposal (TPH exceeds 2,500 mg/kg).

GIVEN:

Pipe diameter	8	inch	
Type	cast iron		
Length of pipe segment	50	feet	
Ground surface elevation	10.0	ft	
Groundwater table elevation	3.0	ft	
Proposed excavation depth (D)	8	ft	
Trench width at bottom	10	ft	
Side slope	1H:1V		

ANALYSIS:

Calculate excavation volume (V)

Use average end area method to calculate volume.

Determine excavation area at bottom (A_B)

Bottom excavation length	50.0	ft	
Bottom excavation width	6	ft	
A_B	300	sq ft	(50' x 6')

Determine excavation area at surface (A_S)

Calculate excavation length at surface

bottom length	50.0	ft	
sidewall horizontal length	8.0	ft	
sidewall horizontal length	8.0	ft	
Surface excavation width (L_S)	66.0	ft	

Calculate excavation width at surface

bottom width	6.0	ft	
sidewall horizontal length	8.0	ft	
sidewall horizontal length	8.0	ft	
Surface excavation width (L_S)	22.0	ft	
A_S	1,452	sq ft	(66' x 22')

Excavation volume (V)

$V = ((A_B + A_S)/2) \times D$

A_B	300	sf	
A_S	1,452	sf	
D	8	ft	
V	7,008	cf	({[300+1452]/2} x 8')
V	260	CY	(7,008 cf/27 cf/CY)
	389	tons	(260 CY x 1.5 ton/CY)
Disposal soil quantity	130	CY	(260 cf x 0.5)
	195	tons	(130 CY x 1.5 ton/CY)

SUMMARY: Total Excavation Volume 260 CY

Disposal Quantities	Weight	Volume	
Soil (10% expansion)	195 tons	143	CY
8-inch CI pipe		50	feet

Fill Material Required				
Total volume required		260	CY	
Area bottom		300	sf	
Assume 50 % of excavated soil RCRA D T&D				
Assume 1 foot layer stone stabilization layer				
Assume filter fabric over stone				
Source				
1.5-inch crushed stone		11	CY	(300 sf x 1]/27 cf/CY)
Excavated soil returned		130	CY	(260 CY x 0.5)
Additional fill soil imported		119	CY	(260 CY - (130 + 11) CY)
Topsoil (6 inches)	27 CY			({1,452 sf x 0.5'}/27 cf/CY)
Common fill	92 CY			(119 CY - 27 CY)
Filter fabric		33	SY	(300 sf/9 sf/SY)

TETRA TECH NUS, INC. **CALCULATION WORKSHEET**

CLIENT: NAVFAC CTO 65 JOB NO.

SUBJECT: Foundation and Soil Excavation Areas and Volumes
Removal Action Phase 2
OFFTA, NAVSTA Newport
Drainage Pipe 2

BY: JRF CKD BY: BGS DATE: 5/21/2007

OBJECTIVE: Estimate the volume of soil and material to be excavated by removal of Drainage Pipe 2 if excavation depth is to top of groundwater table. Assume 1) 50-foot segment of pipe removed by excavation; 2) excavation is terminated 20 feet from top of beach embankment slope. Remaining downgradient pipe (approximately 50 feet) will be removed by pulling from embankment; 3) 50% of the soil will be designated for off-site disposal (TPH exceeds 2,500 mg/kg).

GIVEN:

Pipe diameter	8	inch	
Type	cast iron		
Length of pipe segment	50	feet	
Ground surface elevation	10.0	ft	
Groundwater table elevation	3.0	ft	
Proposed excavation depth (D)	8	ft	
Trench width at bottom	10	ft	
Side slope	1H:1V		

ANALYSIS:

Calculate excavation volume (V)

Use average end area method to calculate volume.

Determine excavation area at bottom (A_B)

Bottom excavation length	50.0	ft	
Bottom excavation width	6	ft	
A_B	300	sq ft	(50' x 6')

Determine excavation area at surface (A_S)

Calculate excavation length at surface

bottom length	50.0	ft	
sidewall horizontal length	8.0	ft	
sidewall horizontal length	8.0	ft	
Surface excavation width (L_S)	66.0	ft	

Calculate excavation width at surface

bottom width	6.0	ft	
sidewall horizontal length	8.0	ft	
sidewall horizontal length	8.0	ft	
Surface excavation width (L_S)	22.0	ft	
A_S	1,452	sq ft	(66' x 22')

Excavation volume (V)

$V = ((A_B + A_S)/2) \times D$

A_B	300	sf	
A_S	1,452	sf	
D	8	ft	
V	7,008	cf	({[300+1452]/2} x 8')
V	260	CY	(7,008 cf/27 cf/CY)
	389	tons	(260 CY x 1.5 ton/CY)
Disposal soil quantity	130	CY	(260 cf x 0.5)
	195	tons	(130 CY x 1.5 ton/CY)

SUMMARY: Total Excavation Volume 260 CY

Disposal Quantities	Weight		Volume		
Soil (10% expansion)	195	tons	143	CY	
8-inch CI pipe			50	feet	
Fill Material Required					
Total volume required			260	CY	
Area bottom			300	sf	
Assume 50 % of excavated soil RCRA D T&D					
Assume 1 foot layer stone stabilization layer					
Assume filter fabric over stone					
Source					
1.5-inch crushed stone			11	CY	(300 sf x 1]/27 cf/CY)
Excavated soil returned			130	CY	(260 CY x 0.5)
Additional fill soil imported			119	CY	(260 CY - (130 + 11) CY)
Topsoil (6 inches)	27	CY			({1,452 sf x 0.5'}/27 cf/CY)
Common fill	92	CY			(119 CY - 27 CY)
Filter fabric			33	SY	(300 sf/9 sf/SY)

CLIENT: NAVFAC CTO 65 JOB NO.

SUBJECT: Foundation and Soil Excavation Areas and Volumes
Removal Action Phase 2
OFFTA, NAVSTA Newport
Concrete Apron

BY: JRF CKD BY: BCS DATE: 5/21/2007

OBJECTIVE: Estimate the soil and concrete volumes to be generated by removal of Concrete Apron. Only the apron surface is visible. Assume apron is 1.5 foot thick and excavation depth is 2 feet. Assume 1) structure is constructed of reinforced concrete. Dimensions are assumed; original construction plans not available; 2) 50% of the soil will be designated for off-site disposal (TPH exceeds 2,500 mg/kg).

GIVEN:	Structure Length		90	ft	from CAD
	Structure Width		40	ft	from CAD
	Structure depth		1.5	ft	
	Ground surface elevation		10.0	ft	
	Groundwater table elevation		3.0	ft	
	Proposed excavation depth (D)		2	ft	
	Concrete density		150	lb/cf	
ANALYSIS:	Calculate excavation volume (V_E)				
	Assume excavation extends 1 foot beyond apron limits				
	Excavation Length		92	ft	
	Excavation Width		42	ft	
	Excavation Area		3,864	sf	(92' x 42')
	Excavation depth		2.0	ft	
		V_E	7,728	cf	(3,864' x 2')
			286	CY	(7,728 cf/27 cf/CY)
	Calculate reinforced concrete volume (V_C)				
	Apron area		3,600	sf	(90' x 40')
	Apron volume	V_C	5,400	cf	(90' x 40' x 1.5')
			200	CY	(5,400 cf/27 cf/CY)
			810,000	lb	(5,400 cf x 150 lb/cf)
			405	tons	(810,000 lb/2,000 lb/ton)
	Calculate soil volume (V_{SO})				
		V_{SO}	$V_E - V_C$		
		V_E	7,728	cf	
		V_C	5,400	cf	
			2,328	cf	
			86	CY	(2,328 cf/27 cf/CY)
	Disposal soil quantity		43	CY	(86 cf x 0.5)
			65	tons	(43 CY x 1.5 ton/CY)

SUMMARY: Total Excavation Volume 286 CY

Concrete	200 CY	69.9%	
Soil	86 CY	30.1%	
	286 CY	100.0%	

Disposal Quantities	Weight	Volume	
Rubble (40% expansion)	405 tons	280 CY	(200 CY x 1.4)
Soil (10% expansion)	65 tons	47 CY	(86 CY x 0.5 x 1.1)

Fill Material Required

Total volume required		286 CY	
Assume 50 % of excavated soil RCRA D T&D			
Source			
Excavated soil returned		43 CY	(86 CY x 0.5)
Additional fill soil imported		243 CY	(286 CY - 43 CY)
Topsoil (6 inches)	72 CY		({3,864 sf x 0.5'}/27 cf/CY)
Common fill	172 CY		(243 CY - 75 CY)

TETRA TECH NUS, INC. **CALCULATION WORKSHEET**

CLIENT: NAVFAC CTO 65 JOB NO.

SUBJECT: Foundation and Soil Excavation Areas and Volumes
Removal Action Phase 2
OFFTA, NAVSTA Newport
Area A

BY: JRF CKD BY: BSG DATE: 5/21/2007

OBJECTIVE: Estimate the volume of soil to be excavated from Area A if excavation depth is to top of groundwater table. Assume that 50% of the soil will be designated for off-site disposal (TPH exceeds 2,500 mg/kg).

GIVEN:

Affected Area length	46.0	ft
Affected Area Width	46.0	ft
Ground surface elevation	10.0	ft
Groundwater table elevation	3.0	ft
Proposed excavation depth (D)	8	ft
Side slope	1H:1V	

ANALYSIS:

Use average end area method to calculate volume.
Determine excavation area at bottom (A_B)

Bottom excavation length		50.0	ft
Bottom excavation width		50.0	ft
	A_B	2,500	sq ft

Determine excavation area at surface (A_S)

Calculate excavation length at surface

bottom length	50.0	ft
sidewall horizontal length	8.0	ft
sidewall horizontal length	8.0	ft
Surface excavation length (L_S)	66.0	ft
Surface excavation width (W_S)	66.0	ft
A_S	4,356	sq ft

Calculate volume (V)

$V = ((A_B + A_S)/2) \times D$

A_B	2,500	sf	
A_S	4,356	sf	
D	8	ft	
V	27,424	cf	
V	1,016	CY	
Disposal soil quantity	508	CY	(1,016 cf x 0.5)
	762	tons	(508 CY x 1.5 ton/CY)

SUMMARY:

Total Excavation Volume 1,015.7 CY

Soil	508	CY	50.0%
	508	CY	50.0%

Disposal Quantities	Weight		Volume		
Soil (10% expansion)	762	tons	559	CY	(508 CY x 1.1)

Fill Material Required

Total volume required			1,016	CY	
Area bottom			2,500	sf	
Assume 50 % of excavated soil RCRA D T&D					
Assume 1 foot layer stone stabilization layer					
Assume filter fabric over stone					
Source					
1.5-inch crushed stone			93	CY	([2,500 sf x 1] / 27 cf/CY)
Excavated soil returned			254	CY	(1,016 CY x 0.5)
Additional fill soil imported			669	CY	(1,016 CY - (508 + 93) CY)
Topsoil (6 inches)	125	CY			([2,500 sf x 0.5']/27 cf/CY)
Common fill	544	CY			(669 CY - 125 CY)
Filter fabric			278	SY	(2,500 sf/9 sf/SY)

TETRA TECH NUS, INC. **CALCULATION WORKSHEET**

CLIENT: NAVFAC CTO 65 JOB NO.

SUBJECT: Foundation and Soil Excavation Areas and Volumes
Removal Action Phase 2
OFFTA, NAVSTA Newport
10 Test Excavations

BY: JRZ CKD BY: BFS DATE: 5/21/2007

OBJECTIVE: Estimate the volume of soil to be excavated by test excavation operations if excavation depth is to top of groundwater table. Assume 20% of the soil will be designated for off-site disposal (TPH exceeds 2,500 mg/kg).

GIVEN:

Groundwater table elevation	3.0	ft
Proposed excavation depth (D)	8	ft
Side slope	1H:1V	

ANALYSIS: Calculate one test excavation volume (V)

Use average end area method to calculate volume.

Determine excavation area at bottom (A_B)

Bottom excavation length	4.0	ft
Bottom excavation width	4.0	ft
A_B	16	sq ft

Determine excavation area at surface (A_S)

Calculate excavation length at surface

bottom length	4.0	ft
sidewall horizontal length	8.0	ft
sidewall horizontal length	8.0	ft
Surface excavation length (L_S)	20.0	ft
Surface excavation width (W_S)	20.0	ft
A_S	400	sq ft

Volume (V) for one test excavation:

$V = ((A_B + A_S)/2) \times D$

A_B	16	sf	
A_S	400	sf	
D	8	ft	
V	1,664	cf	({[16+400]/2} x 8')
V	62	CY	(1,664 cf/27 cf/CY)

Volume (V) for ten test excavations:

V x 10			
V	61.6	CY	
	10	test excavations	
	616	CY	
	924	tons	(616 CY x 1.5 ton/CY)

Disposal soil quantity	123	CY	(616 cf x 0.2)
	185	tons	(123 CY x 1.5 ton/CY)

SUMMARY: Total Excavation Volume 616 CY

Disposal Quantities	Weight		Volume		
Soil (10% expansion)	185	tons	136	CY	
Fill Material Required					
Total volume required			616	CY	
Area bottom			16	sf	
Assume 20 % of excavated soil RCRA D T&D					
Assume 1 foot layer stone stabilization layer					
Assume filter fabric over stone					
Source					
1.5-inch crushed stone			6	CY	([16 sf x 1]/27 x 10 cf/CY)
Excavated soil returned			493	CY	(616 CY x 0.8)
Additional fill soil imported			117	CY	(616 CY - (493 + 6) CY)
Topsoil (6 inches)	74	CY			({400 sf x 0.5'}/27 cf/CY x 1
Common fill	43	CY			(222 CY - 46 CY)
Filter fabric			18	SY	(16 sf/9 sf/SY x 10)

TETRA TECH NUS, INC. **CALCULATION WORKSHEET**

CLIENT: NAVFAC CTO 65 JOB NO.

SUBJECT: Foundation and Soil Excavation Areas and Volumes
Removal Action Phase 2
OFFTA, NAVSTA Newport
Foundations 1, 2 and 3

BY: JF CKD BY: DATE: 5/21/2007

OBJECTIVE: Estimate the soil and concrete volumes to be generated by removal of three concrete foundations. Assume 1) each foundation consist of 8-inch walls, 8-inch footer and 6-inch slab constructed of reinforced concrete. Dimensions are assumed; original construction plans not available; 2) 50% of the soil will be designated for off-site disposal (TPH exceeds 2,500 mg/kg).

GIVEN:

Foundation footprint length	24.0	ft	
Foundation footprint width	24.0	ft	
Ground surface elevation	10.0	ft	
Groundwater table elevation	3.0	ft	
Proposed excavation depth (D)	6	ft	
Side slope	1H:1V		

ANALYSIS: Calculate excavation volume (V_E)

Determine excavation area at bottom (A_B)

Bottom excavation length (L_B)	24.0	ft	
Bottom excavation width (W_B)	24.0	ft	
A_B	576	sq ft	(24' x 24')

Determine excavation area at surface (A_S)

Calculate excavation length at surface

bottom length	24.0	ft	
sidewall horizontal length	6.0	ft	
sidewall horizontal length	6.0	ft	
Surface excavation length (L_S)	36.0	ft	
Surface excavation width (W_S)	36.0	ft	
A_S	1,296	sq ft	(36' x 36')

Calculate volume (V_E)

$V_E = ((A_B + A_S)/2) \times D$

A_B	576	sf	
A_S	1,296	sf	
D	6	ft	
V	5,616	cf	({[576+1296]/2} x 6')
V	208	CY	(5,616 cf / 27 cf/CY)

Calculate reinforced concrete volume (V_C)

Walls	24	ft			
	4	ft			
	0.75	ft			
	72	cf			
	4	each			
			288	cf	(24' x 4' x 0.75' x 4)
Footer	24.0	ft			
	2.0	ft			
	0.8	ft			
	4				
			144	cf	(24' x 2' x 0.75' x 4)
Slab	24.0	ft			
	24.0	ft			
	0.5	ft			
			288	cf	(24' x 24' x 0.5')
V_C			720	cf	
			26.7	CY	(720 cf/27 cf/CY)
			108,000	lb	(720 cf x 150 lb/cf)
			54.0	tons	(108,000 lb/2,000 lb/ton)

Calculate soil volume (V_{SO})

V_{SO}	$V_E - V_C$			
V_E	5,616	cf		
V_C	720	cf		
	4,896	cf		
	181	CY		(5,595 cf/27 cf/CY)
Disposal soil quantity	90.7	CY		(187 cf x 0.5)
	136.0	tons		(93.3 CY x 1.5 ton/CY)

SUMMARY: Each Foundation Excavation Volume 208 CY

Concrete	26.7 CY	12.8%	
Soil	181 CY	87.2%	
	208 CY	100.0%	

Disposal Quantities	Weight		Volume		
Rubble (40% expansion)	54	tons	37.3	CY	(21.3 CY x 1.4)
Soil (10% expansion)	136	tons	99.7	CY	(187 CY x 0.5 x 1.1)

Fill Material Required

Total volume required	208	CY		
Assume 50 % of excavated soil RCRA D T&D Source				
Excavated soil returned			91	CY (187 CY x 0.5)
Additional fill soil imported			117	CY (208 CY - 43 CY)
Topsoil (6 inches)	24	CY		({1,296 sf x 0.5'}/27 cf/C
Common fill	93	CY		(115 - 24 CY)

Three Foundations Excavation Volum			624	CY	(208 x 3)
Concrete	80	CY	12.8%		(26.7 x 3)
Soil	544	CY	87.2%		(181 x 3)
	624	CY	100.0%		

Disposal Quantities	Weight		Volume		
Rubble (40% expansion)	162	tons	112	CY	(29.9 x 3)
Soil (10% expansion)	408	tons	299	CY	(102.7 CY x 0.5 x 1.1)

Fill Material Required			
Total volume required	624	-	
Assume 50 % of excavated soil RCRA D T&D Source			
Excavated soil returned		272 CY	(93 CY x 3)
Additional fill soil imported		352 CY	(624 CY - 280 CY)
Topsoil (6 inches)	72 CY		(24 CY x 3)
Common fill	280 CY		(344 CY - 72 CY)

APPENDIX G

DETERMINATION OF NAPL AT NAVY IR SITES IN RHODE ISLAND

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND, MID-ATLANTIC
9742 MARYLAND AVENUE
NORFOLK, VA 23511-3095

IN REPLY REFER TO:

5090
OPNEEV4/15/6016
NCV

Mr. Matt DeStefano
Supervisor, Office of Waste Management
State of Rhode Island Department of Environmental Management
235 Promenade Street
Providence RI 02908-5767

Dear Mr. DeStefano:

Subject: Determination of NAPL at Navy IR Sites in Rhode Island
Naval Station Newport, Newport, Rhode Island

The Navy is writing to you in reference to the ongoing issue regarding the interpretation of the State of Rhode Island Department of Environmental Management's (RIDEM) definition of the presence of Non-Aqueous Phase Liquids (NAPL) at various Installation Restoration (IR) sites located at Naval Station (NAVSTA), Newport, Rhode Island. As you are aware, this continued debate between the Navy and RIDEM has delayed the Navy's ability to move forward with the CERCLA process at the various sites.

A document prepared on behalf of NAVFAC Mid-Atlantic, Naval Facilities Engineering Command (NAVFAC MIDLANT) by our environmental consultant, Tetra Tech NUS, Inc. is enclosed with this letter. It discusses the technical definition as well as the Navy's interpretation regarding the regulatory aspects of what a petroleum-based NAPL is and how it should be identified at NAVSTA Newport sites located in the State of Rhode Island. The document, entitled "Evaluation of Non-Aqueous Phase Liquid Presence and Remediation Requirements at Naval Station Newport, Newport Rhode Island" was prepared based on documentation of investigations and removals conducted under the Navy's Installation Restoration (IR) Program at NAVSTA Newport and the Navy's current understanding of the technical aspects of petroleum migration in the environment.

This extensive evaluation of the subject was performed due to, a) the technical difficulties posed to investigators by the behavior of oils in different saturated and unsaturated soils, and b) the Navy's understanding of RIDEM's interpretation of Section 8.07A of the Division of Site Remediation Regulations

(August 2004). RIDEM has both orally and in writing stated that the presence of a sheen in water observed in the ground or removed from the ground, and the presence of oily residue in soils, even at concentrations of TPH below 500 mg/kg, are both conditions that constitute the presence of a NAPL requiring a remedial action. The Navy disagrees with this interpretation for several reasons which are discussed below and are based upon the analyses contained in the enclosure.

The authors of the enclosure evaluated the behavior of NAPL with regard to petroleum (oil) spills both above and below the water table. The authors note that oil released to the subsurface first migrates through the soil and is later trapped within the soil matrix when the migration reaches a certain distance based on volume, viscosity, and a number of other physical factors. They recognize that it is during the mobile stages that NAPL constitutes a danger to down gradient receptors and resources (i.e. into buildings via vapor intrusion, into groundwater resource areas, and into otherwise clean soils). As the material begins to degrade, some components of the oil volatilize and, over time, the volatilization rate slows. In addition, dissolution of soluble compounds into groundwater also slows over time as the oil degrades and after some time after the release, the oil becomes trapped in isolated, discontinuous masses within the soil matrix. In this state, termed residual saturation, the residual oil is immobile and remains trapped within the soil matrix until that matrix is disturbed.

It is this residual oil trapped within the soil matrix that has been the subject of disagreement between the Navy and RIDEM as to whether or not this situation constitutes the presence of NAPL. When soils are disturbed in the presence of water, globules of oil can be liberated from the soil matrix and an oily sheen can appear even if no measurable oil is present in monitoring wells under equilibrium conditions. This same situation can also occur even when there is residual oil in soils present but at concentrations below RIDEM petroleum criteria. It is the Navy's belief that if the converse to the above situation is taken, it would result in the reopening of a site for which no additional actions would have already been determined based on laboratory analysis of soil and groundwater samples and that the reopening would be based solely on the visual observation of a sheen which may have appeared during activities conducted for other purposes not related to the IR Program.

Furthermore, when the presence of a sheen is observed on groundwater in an excavation or when oily soils exist at or below the water table at NAVSTA Newport sites, RIDEM has maintained that this constitutes the presence of NAPL and therefore exceeds the upper concentration limit (UCL) under Section 8.07A of the RIDEM remediation regulations. The Navy feels that basing enforcement decisions on the above is more likely to lead to inconsistent application of the State regulations since identification of a sheen is considered subjective, relying on the eyesight and attention of the person making the observation, whereas most other compliance determinations under RIDEM regulations are based on quantitative measurements such as laboratory analysis, calculated values and/nor accepted mathematical models.

To further support the Navy's claim, a limited file review was conducted at RIDEM Division of Site Remediation to determine the consistency of enforcement on the above point(s) at other sites within Rhode Island. The Navy's determination was that most of RIDEM's files did not contain specific documentation that discusses the presence or absence of sheens in water during investigative steps or in the determination of no further action.

Enclosure (1) recommends that clear and measurable endpoints be established to determine if the UCL under Section 8.07A of the RIDEM regulations is exceeded. At most other States, that endpoint is defined using the following policy statement:

> *Presence of NAPL will be determined through use of an oil-water interface probe detecting the presence of NAPL at a thickness of ¼ inch or greater in groundwater monitoring wells under equilibrium conditions.*

The identification of NAPL in the manner expressed above should be used at all Navy sites within the State of Rhode Island to ensure that the State's cleanup criteria for each environmental action are applied consistently across the State.

The Navy feels that the above is not the case based upon the apparent accepted practice for NAPL determination that is being used at the former Naval Construction Battallion Center (NCBC) in Davisville, Rhode Island. At NCBC Davisville, the State-approved Long Term Monitoring (LTM) Workplan for EBS Site 21 includes a Quality Assurance Project Plan (QAPP) in which Section 9.5 of the QAPP states, "that the presence of LNAPL will be determined through use of an oil-water interface probe detecting the presence of NAPL at a thickness of ¼ inch or greater".

Since the EBS 21 Long Term Monitoring Workplan is a final document, dated August 2001, and no comments were received from RIDEM on that document, the Navy must presume that this measurement endpoint outlined in the QAPP was accepted by RIDEM.

The Navy would like to propose that the above approach that is apparently being applied at NCBC Davisville be used at NAVSTA Newport so that a consistent determination as to the presence of NAPL can be applied for all Navy IR Sites located throughout the State of Rhode Island.

We look forward to continuing to work with RIDEM toward the eventual restoration of CERCLA sites located at NAVSTA Newport. If you have any questions regarding this letter or enclosure (1), please do not hesitate to contact the Navy's Remedial Project Manager (RPM) for NAVSTA Newport, Mr. James Colter, at (757) 444-4217 or by email at james.colter@navy.mil.

Sincerely,

Robert G. Schirmer, P.E.
Environmental Product
Line Team Leader
by direction of the
Commanding Officer

Enclosure: (1) Evaluation of Non-Aqueous Phase Liquid Presence and Remediation Requirements at Naval Station Newport, Newport, Rhode Island

Copy to: (w/enclosure)
RIDEM, Paul Kulpa
USEPA Region I, Kymberlee Keckler
Gannett Fleming, Jennifer Stump
NAVSTA Newport, Cornelia Mueller

APPENDIX H

EPA REGION 1 SOP FOR CONCRETE SAMPLING

REGION I, EPA-NEW ENGLAND

DRAFT
STANDARD OPERATING PROCEDURE
FOR SAMPLING CONCRETE IN THE FIELD

U.S. EPA-NEW ENGLAND
Region I
Quality Assurance Unit Staff
Office of Environmental Measurement and Evaluation

Prepared by: Alan W Peterson — **Date:** 12/30/97
Quality Assurance Chemist

Reviewed by: Andrew Beliveau — **Date:** 12/30/97
Senior Technical Specialist

Approved by: Nancy Barmakian — **Date:** 12/30/97
Branch Chief

Table of Contents

Region I, EPA New England
Standard Operating Procedure for Sampling Concrete in the Field

1.0 Scope and Application

The following Standard Operating Procedure (SOP) describes a concrete sampling technique which uses an impact hammer drill to generate a uniform, finely ground, powder which is easily homogenized, extracted and analyzed. This procedure is primarily geared at providing enough sample for one or two different analyses at a time. That is, the time required to generate sufficient sample for a full sweet of analyses may be impractical. The concrete powder is suitable for all types of environmental analyses, with the exception of volatile compounds, and may be analyzed in the field or at a fixed laboratory. This procedure is applicable for the collection of samples from concrete floors, walls, and ceilings.

The impact hammer drill is far less labor intensive than previous techniques using coring devices, or hammers and chisels. It allows for easy selection of sample location and sample depth. Not only can the project planner control the depth to sample into the concrete, from surface samples (0 - 2 inch) down to a core of the entire slab, but the technique can also be modified to collect samples at discrete depths within the concrete slab.

Another issue with concrete sampling is the fact that the amount of time spent drilling translates into the weight of sample produced. Thus, to maximize sampling time, it is important to know the minimum amount of sample required for each analysis. To do this, the project planner should take the following steps: 1) Use the Data Quality Objective (DQO) process and familiarity with the site to develop the objectives of the sampling project and the depth(s) of sample to be collected. 2) Review the site history and any previous data collected to determined possible contaminants of concern. 3) Establish the action levels for those possible contaminants and determine the appropriate analytical methods (both field and/or fixed laboratory) to meet the DQOs of the project. 4) Based on the detection limits of these methods, determine the amount of sample required for each analysis and the total sample weight require for each sample location (including quality control samples).

As with any environmental data collection project, all aspects of a concrete sampling episode should be well thought out, prior to going out in the field, and thoroughly described in a Quality Assurance Project Plan (QAPP). The QAPP should clearly state the DQOs of the project and document a complete Quality Assurance/Quality Control program to reconcile the data generated with the established DQOs. For more information on these subjects, refer to EPA documents QA/R-5, EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations, and QA/G-4, Guidance for the Data Quality Objective Process.

2.0 Method Summary

A one-inch diameter carbide drill bit is used in a rotary impact hammer drill to generate a fine concrete powder suitable for analysis. The powder is placed in a sample container and homogenized for field or fixed laboratory analysis. The procedure can be used to sample a single depth into the concrete, or may be modified to sample the concrete at distinctly different depth zones. The modified depth sampling procedure is designed to minimize any cross contamination

between the sampling zones. If different sampling depths are required, two different diameter drill bits and a vacuum sampling apparatus are employed.

3.0 Health and Safety

Eye and hearing protection are required at all times during sample drilling. A small amount of dust is generated during the drilling process. Proper respiratory protection and/or a dust control system must be in place at all times during sampling.

4.0 Interferences and Potential Problems

Since this sampling technique produces a finely ground uniform powder, physical matrix effects from variations in the sample consistency (i.e., particle size, uniformity, homogeneity, and surface condition) are minimized. Matrix spike analysis of a sample is highly recommended to monitor for any matrix related interferences.

As stated in Section 1.0 above, this sampling procedure is not recommended for volatile organic compound (VOC) analysis. The combination of heat generated during drilling and the exposure of a large amount of surface area will greatly reduce VOC recovery. If low boiling point semi-volatile compounds (i.e., naphthalene) are being analyzed, then the drill speed should be reduced to minimize heat build-up.

5.0 Equipment and Supplies

5.1 Single Depth Concrete Sampling

Rotary impact hammer drill
1-inch diameter carbide drill bits
Stainless steel scoopulas
Stainless steel spoonulas (for collecting sample in deeper holes, >2-inches)
Rectangular aluminum pans (to catch concrete during wall and ceiling sampling)
Gasoline powered generator (if alternative power source is required)

5.2 Multiple Depth Sampling (in addition to all the above)

2 inch diameter carbide drill bits
Vacuum/sample trap assembly (see Section 7.2 and Figure 1)
Vacuum pump
2-hole rubber stopper
Glass tubing (to fit stopper)
Large glass test tubes, or Erlenmeyer flasks, for sample trap (several are suggested)
Polyethylene tubing for trap inlet (Tygon tubing may be used for the trap outlet)
Pasture pipets
Pipe cleaners
In-line dust filter (glass fiber filter, or equivalent)

6.0 Sample Containers, Preservation, and Storage

Concrete samples must be collected in glass containers for organic analyses, and may be collected in either glass or plastic containers for inorganic analyses. In general, a 2-ounce sample container with Teflon-lined cap (wide-mouth jars are preferred) will hold sufficient volume for most analyses. A 2-ounce jar can hold roughly 90 grams sample. Note, samples which require duplicate and/or matrix spike/matrix spike duplicate analyses may require a larger sample container, or additional 2-ounce sample containers.

Organic samples are to be shipped on ice and maintained at 4EC (∀ 2EC) until the time of extraction and analysis. Inorganic samples may be shipped and stored at room temperature. Refer to 40 CFR Part 136 for guidelines on analysis holding times.

To maintain sample integrity, chain-of-custody procedures must be implemented at the time of sampling to 1) document all sample locations and associated field sample identification numbers, 2) document all quality control samples taken, including field duplicates, split samples for confirmatory analyses, and PE samples, and 3) document the transfer of field samples from field sampler to field chemist or fixed laboratory.

7.0 Procedure

7.1 Single Depth Concrete Sampling

Lock a 1-inch diameter carbide drill bit into the impact hammer drill and plug the drill into an appropriate power source. (A gasoline generator will be needed if electricity is not available.) For easy identification, sample locations may be pre-marked using a crayon or a non-contaminating spray paint. (Note, the actual drilling point must not be marked.) Depending on the appearance of the sample location, or the objectives of the sampling project, it may be desired to wipe the concrete surface with a clean dry cloth prior to drilling. All sampling decisions of this nature should be noted in the sampling logbook. Begin drilling in the designated location. Apply steady even pressure and let the drill do the work. Applying too much pressure will generate excessive heat and dull the drill bit prematurely. The drill will provide a finely ground concrete powder that can be easily collected, homogenized and analyzed. Having several decontaminated impact drill bits on hand will help expedite sampling when numerous sample locations are to be drilled.

Sample Collection

A 2-inch deep hole (using a 1-inch diameter drill bit) generates about 10 grams of concrete powder. Based on this and the action levels for the project, determine the sampling depth, and/or the number of sample holes to be composited, to generate sufficient sample volume for all of the required analyses. (Note, with the absorbency of concrete, a 2-inch deep hole can be considered a surface sample.)

A decontaminated stainless steel scoopula can be used to collect the sample. The powder can either be collected directly from the surface of the concrete and/or the concrete powder can be scraped back into the hole and the less rounded back edge of the scoopula can be used to collect the sample. For holes greater than 2-inches in depth, a stainless steel spoonula will make it easier to collect the sample from the bottom of the hole.

To ensure collection of a representative sample when multiple analyses are required, a concrete sample should always be collected and homogenized in a single container and then divided up into the individual containers for the various analyses or split samples. This is particularly important when sample holes are deep, or when several holes are drilled adjacent to each other to form a sample composite.

Wall and Ceiling Sampling

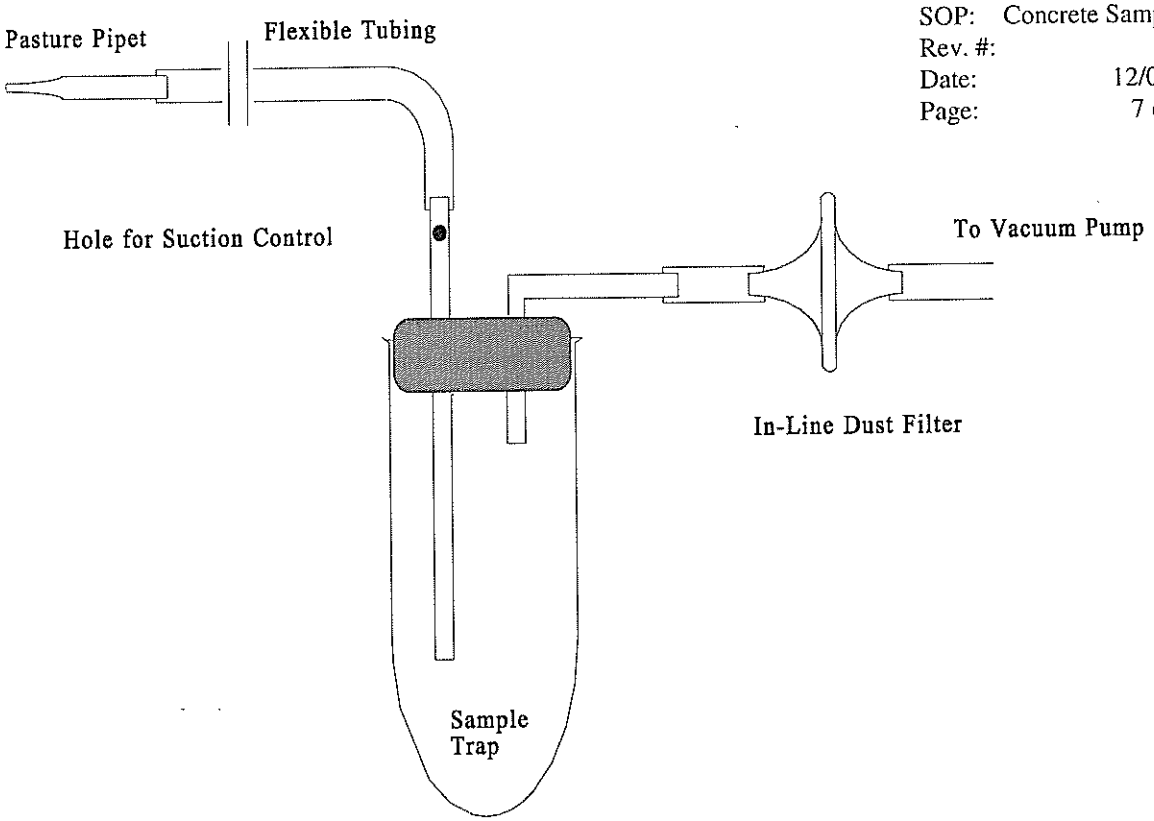
A team of two samplers will be required for wall and ceiling sampling. The second person will be needed to hold a clean catch surface (i.e., an aluminum pan) below the drill to collect the falling powder. For wall samples, a scoopula, or spoonula, can be used to collect remaining concrete powder from within the hole. For ceiling holes, it may be necessary to drill the hole at an angle so the concrete powder can fall freely in the collection plan (and avoid falling on the drill). Another alternative might be to use the chuck-end of the drill bit and punch a hole through the center of the collection pan. The drill bit is then mounted through the pan and into the drill. Thus, the driller can be drilling straight up while the assistant steadies the pan to catch the falling dust. As a precaution, it may be advantageous to tape a piece of plastic around the drill, just below the chuck, to avoid dust contaminating the body of the drill and entering the mechanical vents. (Note, the plastic should deflect dust from the drill, but be loose enough underneath to allow for proper ventillation.)

7.2 Multiple Depth Concrete Sampling

The above method for concrete sampling can also be used to collect samples from different depths within the concrete. To do this, two different sized drill bits (i.e., 2 inch and 1 inch) and a simple vacuum pump with a vacuum trap assembly is required (see Figure 1). First, the 1 inch drill bit is used to drill to the first level and the concrete sample is collected as described in Section 7.1. The vacuum pump is then turned on and the hole is cleaned out using the vacuum trap assembly. The drill bit is then changed to the 2 inch bit and the next depth is drilled out (the 2 inch bit is used to avoid contact with the sides of the first hole). A clean tube or flask is placed on the vacuum trap, and the sample from the second drilling is collected. To go further, the 1 inch drill is used to open up the hole to the second level, the hole is cleared, and then the 2 inch drill is used again to go to a third level, etc. Note, the holes and concrete surface should be vacuumed thoroughly to minimize any cross-contamination between sample depths.

Vacuum Trap Design and Clean-out

The trap presented in Figure 1 is a convenient and thorough way for collecting and removing concrete powder from drilled holes. The trap system is designed to allow for control of the suction from the vacuum pump and easy trap clean-out between samples. Note, by placing a hole in the inlet tube (see Figure 1), a finger on the hand holding the trap can be used to control the suction at the sampling tip. Thus, when this hole is left completely open, there will be no suction, and the sampler can have complete control over where and what to sample. To change-out between samples the following steps should be taken: 1) The pasture pipet and piece of polyethylene tubing at the sample inlet should be replaced with new materials, 2) the portion of the rubber stopper and glass tubing that was in the trap should be wiped down with a clean damp paper towel (wetted with deionized water) and then dried with a fresh paper towel, 3) a clean



pipe cleaner should be drawn through the glass inlet tube to remove any concrete dust present, and 4) the glass tube or flask used to collect the sample should swapped out with a clean decontaminated sample trap. Having several clean tubes or flasks on hand will facilitate change-out between samples.

7.3 Decontamination Procedure

Necessary supplies for decontamination include: two small buckets, a scrub brush, potable water, deionized water, a squirt bottle for the deionized water, and paper towels. The first bucket contains a soap and potable water solution, and the second bucket contains just potable water. Place all used drill bits and utensils in the soap and water bucket. Scrub each piece thoroughly using the scrub brush. Note, the concrete powder does cling to the metal surfaces, so care should be taken during this step, especially with the twists and curves of the drill bits. Next, rinse each piece in the potable water bucket, and follow with a deionized water rinse from the squirt bottle. Place the deionized water rinsed pieces on clean paper towels and individually dry and inspect each piece. Note, all pieces should be dry prior to reuse.

8.0 Field Documentation

All Site related documentation and reports generated from concrete sampling should be maintained in the central Site file. If personal logbooks are used, legible copies of all pertinent pages must be placed in the Site file.

8.1 Field Logbooks

All field documentation should be maintained in bound logbooks with numbered pages. If loose-leaf logsheets are used to document site activities, extra care should be taken in keep track of all logsheets. The original copy of all logsheets should be maintained in the central Site file. Note,

all sample locations must be documented by tying in their location to a detailed site map, or by using two or more permanent landmarks. The following information should be documented in the field logbooks:

X Site name and location,
X EPA Site Manager,
X Name and affiliation of field samplers (EPA, Contractor company name, etc.),
X Sampling date,
X Sample locations and IDs,
X Sampling times and depths, and
X Other pertinent information or comments

8.2 Sample Labeling and Chain-of-Custody

8.2.1 Sample Labels

Sample labels will be affixed to all sample containers. Labels must contain the following information:

X Project name,
X Sample number, and/or location
X Date and time of sampling,
X Analysis,
X Preservation, and
X Sampler=s name.

8.2.2 Chain-of-Custody

All samples must be traced from collection, to shipment, to laboratory receipt and laboratory custody. The Chain-of-Custody (COC) Record is a multi-part form that is initiated as samples are acquired and accompanies a sample (or group of samples) as they are transferred from person to person. The COC form is signed by all individuals responsible for sampling, sample transport, and laboratory receipt. (Note, overnight deliver services, often used with sample transport, are exempt from having to sign the COC form. However, copies of all shipping invoices must be kept with the COC documentation.) One copy of the COC is retained by the field sampling crew, while the original (top, signed copy) and remaining carbonless copies are placed in a zip-lock bag and taped to the inside lid of the shipping cooler. If multiple coolers are required for a sample shipment to a single laboratory, the COC need only be sent with one of the coolers. The COC should state how many coolers are included with the shipment. All sample shipments to different laboratories require individual COC forms. The original COC form accompanies the samples until the project is complete, and is then kept in the permanent project file. A copy of the COC is also kept with the project manager, the laboratory manager, and attached to the data package.

8.2.3 Custody Seal

The Custody seal is an adhesive-backed label which is also part of the chain-of-custody process. The custody seal is used to prevent tampering with the samples after they have been collected in the field and sealed in coolers for transit to the laboratory. The Custody seals are signed and dated by a sampler and affixed across the opening edges of each cooler containing samples. Clear packing tape should be wrapped around the cooler, and over the Custody seal, to secure the cooler and avoid accidental tampering with the Custody seal.

9.0 Quality Assurance and Quality Control (QA/QC)

A solid QA/QC program is essential to establishing the quality of the data generated so that proper project decisions can be made. The following are key quality control elements which should be incorporated into a concrete sampling and analytical program.

9.1 Equipment Blanks

An equipment blank should be performed on decontaminated drill bits and collection utensils at a frequency of 1 per 20 samples or 1 per day, whichever is greater. To prepare the equipment blank, place the decontaminated drill bit and utensils in a large clean stainless steel bowl. Pour sufficient deionized water into the bowl to fill all of the required sample containers. Next, stir the drill bit and utensils in the bowl with a clean utensil to thoroughly mix the blank. Finally, decant off the equipment blank into the sample containers. Note, a clean funnel may help to pour off the equipment blank into the containers.

9.2 Field Duplicates

Field duplicates are samples collected adjacent to each other (collocated) at the same sample location (not two aliquots of the same sample). Field duplicates not only help provide an indicator of overall precision, but measure the cumulative effects of both the field and analytical precision, and also measure the representativeness of the sample. Field duplicates must be prepared and analyzed at a frequency of 1 per 20 samples or 1 per non-related concrete matrix, whichever is greater. An example of a non-related concrete matrix might be the investigation of two different types of chemical spills.

Calculate the Relative Percent Difference (RPD) between the sample and its duplicate using Equation 1.

$$RPD = \frac{|S - D|}{\frac{(S + D)}{2}} \times 100$$

Equation 1
Where:

S	=	Original sample result
D	=	Duplicate sample result

The following general guidelines have been established for field duplicate criteria:

X If both the original and field duplicate values are ∃ practical quantitation limit (PQL), then the control limit for RPD is #50%,
X If one or both values are < PQL, then do not assess the RPD.

If more rigorous field duplicate criteria are needed to achieve project DQOs, then that criteria should be documented in the project QAPP.

If the field duplicate criteria specified above are not met, then flag that target element with an A*@ on the final report for both the original and field duplicate samples. Report both the original and field duplicate analyses; do not report the average. Field duplicate samples should should be indicated on the sample ID. For example, the sample ID can contain the the suffix AFD@.

9.3 Laboratory Duplicates

Laboratory duplicates are two aliquots of the same sample that are prepared, homogenized and analyzed in the same manner. (Note, proper sample homogenization is critical in producing meaningful results.) The precision of the sample preparation and analytical methods is determined by performing a laboratory duplicate analysis. Laboratory duplicates can be prepared in the field and submitted as blind samples, or the laboratory can be requested to perform the laboratory duplicate analysis. In the case of laboratory prepared duplicates, the field sampling team must be sure to provide sufficient sample volume. Laboratory duplicates must be prepared and analyzed at a frequency of 1 per 20 samples or 1 per non-related concrete matrix, whichever is greater.

Calculate the RPD between the sample and its duplicate using Equation 1. The following general guidelines have been established for laboratory duplicate criteria:

X If both the original and laboratory duplicate values are ∃ PQL, then the control limit for RPD is #25%,
X If one or both values are < PQL, then do not assess the RPD.

If duplicate criteria are not met, then flag that target element with an A*@ on the final report for both the original and duplicate samples. Report both the original and duplicate analyses; do not report the average.

9.4 Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate samples (MS/MSDs) are two additional aliquots of a sample which are spiked with the appropriate compound(s) or analyte(s) of concern and then prepared and analyzed along with the original sample. (Note, proper sample homogenization, prior to spiking, is critical in producing meaningful results.) MS/MSDs help evaluate the effects of sample matrix on the analytical methods being used. The field sampling team must provide sufficient sample volume such that the field or fixed laboratory can prepare and analyze MS/MSDs at a frequency of 1 per 20 samples or 1 per non-related concrete matrix, whichever is greater.

Calculate the recovery of each matrix spike compound or analyte using Equation 2.

$$MSR = \frac{SSR - SR}{SA} \times 100$$

Equation 2
Where,

MSR	=	Matrix Spike Recovery,	SA	=	Spike Added
SSR	=	Spiked Sample Result,	SR	=	Sample Result

Calculate the relative percent difference (RPD) between the recoveries of each compound or analyte in the matrix spike and matrix spike duplicate using Equation 3.

$$RPD = \frac{|MSR - MSRD|}{\frac{(MSR + MSRD)}{2}} \times 100$$

Equation 3
Where,

MSR	=	Matrix Spike Recovery
MSRD	=	Matrix Spike Duplicate Recovery

9.5 Performance Evaluation Samples

In accordance with the EPA Region I Performance Evaluation Program Guidance, performance evaluation (PE) samples should be submitted for each type of analysis to be performed in the field or by the fixed laboratory performing full protocol EPA methods. PE samples provide information on the quality of the individual data packages. PE samples are certified standard reference materials (SRMs) from a source other than that used to calibrate the instrument. If both field and fixed laboratories are being used to analyze samples, at least one solid PE sample should undergo both field analysis and confirmatory full protocol EPA method analysis to facilitate data comparability. A copy of the certified values for the SRM must be submitted with the final data packages to facilitate data evaluation.

9.6 Data Verification and Validation

All field data and supporting information (including chain-of-custody) that is collected during a concrete sampling episode should be verified daily, by a person other than that performing the work, to check for possible errors.

During the project planning process, a plan for data validation should be established for all data, both for field and fixed laboratories. All data must be validated to assure that it is of a quality suitable to make project decisions. For help in developing a data validation program refer to Region I, EPA New England, Data Validation Functional Guidelines for Evaluating Environmental Analyses.

9.7 Assessments

9.7.1 Internal Assessments

As part of the Quality Assurance/Quality Control Program for any sampling project, a series of internal assessment checks should be instituted to monitor and maintain the integrity of the sample collection process. Timely internal reviews will insure that proper sampling, decontamination, chain-of-custody and quality control procedures are being followed. Also, the internal assessment review is there to monitor any corrective actions taken, and/or institute corrective actions that should have been taken and were not. All corrective actions taken must be documented in an appropriate logbook, and if any corrective actions impact the final data reported, then they must also be documented in the final report narrative. The results of all internal assessments must be documented in a report, and copies of the report issued to the Project Manager and the Quality Assurance Manager. The original copy of any assessment report must remain with the main project file and be available for review.

9.7.2 External Assessments

The Agency reserves the right to perform periodic field audits to ensure compliance with this SOP.

10.0 References

1) Guidance for the Data Quality Objective Process, QA/G-4, EPA/600/R-96/055, September 1994.

2) EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations, QA/R-5, Interim Final, October 1997.

3) Guidance for the Preparation of Standard Operating Procedures for Quality-related Operations, QA/G-6, EPA/600/R-96/027, November 1995.

4) Region I, EPA-New England Data Validation Functional Guidelines for Evaluating Environmental Analyses, July 1996.

5) EPA Region I Performance Evaluation Program Guidance, July 1996.

6) U.S. EPA Code of Federal Regulations, 40 CFR, Part 136, Appendix B, Revised as of July 1995.

ATTACHMENT A
RESPONSES TO COMMENTS FROM THE USEPA TO THE
DRAFT FINAL REMOVAL ACTION WORK PLAN
OLD FIREFIGHTING TRAINING AREA
NAVSTA NEWPORT, NEWPORT RI
COMMENTS DATED JUNE 25, 2007

General Comment:

EPA reviewed the draft final Work Plan for Non-Time Critical Removal Action at the Old Fire Fighting Training Area, Newport, RI, dated May 2007 in light of its completeness, technical accuracy, and consistency. In an effort to support the Navy's goal to begin the removal action in summer 2007, provide responses to these comments as an addendum to the work plan. A revised work plan is not necessary.

Response: The Comment is noted. Due to the volume of comments from both USEPA and RIDEM, a final document will be prepared.

Specific Comments:

Page Comment

1. p. 5-2, §5.1 The last bullet discusses the ten test pits to be selected by EPA and RIDEM. The text states that the volume of each test pit is expected to be 62 cubic yards whereas the anticipated volume for each of the ten excavations as noted in the draft work plan was of 85 cubic yards, which EPA generally accepted but without dimensional restrictions. EPA anticipates cooperation during the test pitting.

The partial paragraph at the bottom of the page states that Foundations 1, 2, and 3 will only be excavated if time and funding permits; however, the Action Memorandum states that excavation of the three foundations is a part of the proposed removal action. Foundation 1 appears to be associated with training stations 134 and 135; Foundation 2 appears to be one of two oil-water separators; and Foundation 3 appears to be a fuel (gas) storage tank. Consequently, all three foundations are areas where petroleum would have been used or stored and therefore these structures (especially Foundations 2 and 3) are important components of this removal action. EPA believes that excavation of these three foundations should be a higher priority than excavation of the concrete apron.

Response: The comment is noted, and the Navy also anticipates cooperation with the the regulatory parties during the field efforts conducted. Removal of the foundations is noted to be based on time and funding because the final size and thickness of the foundations is still unknown. It is agreed that they will each be opened and evaluated, however, if the wall thickness and the construction shows that they are not likely to harbor contaminants at significant concentrations, it may be unnecessary to remove them.

2. p. 5-3, §5.2 This section discusses FID and Petroflag screening of excavated soil. A table is provided in this section to classify soil based on TPH concentrations. It is presumed that the TPH concentration is based on the Petroflag screening. Please edit the text to clarify what threshold concentration levels will be used for the FID screening. For example, how will soil be classified if the Petroflag screening results were less than 2,500 ppm TPH but the FID screening result was off the scale? Will a calibration task be implemented before conducting the excavations that will correlate the FID and Petroflag results? To make the FID screening useful, threshold values should be established to facilitate decision-making.

Response: The FID will be used as a qualitative instrument, the petroflag results will take precedence with regards to field instrument readings. During excavation, an attempt will be made to correlate FID readings to petroflag results, but it is recognized that different soil conditions, humidity and temperature will have an effect on FID readings, so the petroflag results will take precedence.

3. p. 5-4, §5.2 Sampling and laboratory analysis of the stockpiles classified by screening as reusable for backfill must confirm that the soil destined for reuse on site does not exceed 2,500 mg/Kg.

Response: Comment is noted, this is the approach intended, and will be clarified.

4. p. 6-1, §6.2 The Construction Quality Control (CQC) Plan was not provided. If the CQC Plan will not be incorporated into the work plan then please submit it for review. As proposed in this work plan, the CQC Plan contains information critical to the conduct of the proposed work (including a description of the full sampling and analysis program and protocol for locating and marking before sample locations).

Response: The CQC Plan will be prepared and submitted as a separate document.

5. p. 7-1, §7.2.1 All catch basins must be protected with filter fabric and hay bales or silt fence. Catch basin locations should be clearly identified in the field.

Response: The comment is noted, this will be included in the CQC plan.

6. p. 7-4, §7.4 The work plan does not describe how the results of the laboratory samples collected to confirm the screening results (10% of the screened samples) will be used to modify the screening procedures. What action will the Navy take, if any, if the laboratory analyses do not confirm the Petroflag screening results? What are the confirmation criteria?

Please confirm that no soil will be reused for backfill until samples of each stockpile proposed for reuse on the site have been analyzed and found to satisfy the reuse goals.

Response: A correlative record will be kept for the 10% split samples. A target correlation is will be within a RPD of 50%. If this is not met, another approach will need to be devised. This will be clarified in Section 9 of the final RAWP. This will be clarified in the final document.

7. p. 7-4, §7.4 The excavation volumes presented in the second paragraph on this page are not consistent with the volumes presented in Section 5.1. For example, Section 5.1 states that approximately 1,000 cubic yards will be excavated at the soil hot spot area and 286 cubic yards will be excavated in conjunction with the removal of the concrete apron. The other soil volumes discussed in this section are similarly inconsistent with Section 5.1 and the volumes in both sections have inconsistencies as compared to the volumes presented in the Action Memorandum. Please review and correct for consistency.

Response: The Text will be checked against the volume estimates in the appendix and revised as needed.

8. p. 7-6, §7.6 This section states that four separate stockpiles will be staged in the temporary staging area while Section 7.3 states that the temporary staging area will be segregated into five separate areas. Because Section 7.7 states that clean backfill will be unloaded at the temporary staging area, it is not clear if these two statements are consistent. The table provided in Section 5.2 suggests there will be four distinct types of excavated soil or debris requiring stockpiling. It is presumed that the 200 cubic yards of soil excavated to create the temporary stockpile area would be stockpiled at a separate, unspecified location at the site. Please clarify.

Response: Four areas will be set aside for contaminated stockpiled material. A clean area separated from the stockpile area will be set up for clean and backfill material as needed.

9. p. 7-7, §7.7 If clean backfill will be staged in the temporary staging area where excavated materials will also be staged, the clean backfill should be separated from waste by jersey barriers and staged at the end of the temporary staging area so that it is adjacent only to the concrete rubble/structural debris.

Response: The comment is noted, and this approach will be followed as needed.

10. p. 8-1, §8.0 Regarding the fifth bullet, because trucks hauling excavated material will also travel on the haul road (see bullet number 1), the haul road cannot be considered clean. All trucks leaving the site should be decontaminated at the wheel wash area.

Response: The comment is noted, and this approach will be followed as needed.

11. p. 9-1, §9.0 The QAPP was not provided in this work plan. Will the QAPP be submitted for review and concurrence before initiating work at the site?

Response: A QAPP for sample collection and analysis will be included in the CQC plan.

12. p. 9-2, §9.2 Regarding the example in the last paragraph of this section, please note that with sidewall samples collected on 20-foot centers, each sample represents a 20-foot length so for a sample that exceeds the TPH goal, a 20-foot section (not a10-foot section) would have to be excavated. Please edit the work plan accordingly.

Please clarify the proposed sampling. Excavating an additional area of 10x5x5 (actually 20x5x5, see above) to remove contaminated soil would create an additional excavation with three sidewalls and a bottom. Please confirm that the intent is to apply the same sampling protocol for this new excavation; that is, each of the three sidewalls would be sampled and the bottom would be sampled on a 10-foot grid with a minimum of four bottom samples.

Response: The minimum sampling would be one per 20 feet of side wall. Some excavations are anticipated to be less than 20 feet in length. If visual information suggests a tighter sampling protocol, this will be applied.

13. p. 9-2, §9.3 The first sentence is not correct. The excavated soil and structures will be temporarily placed in 10 cubic yard cast piles based on visual observation and BEFORE any screening. The screening would only occur after the cast piles are created (see Sections 5.2 and 7.4). Please clarify the intent.

Response: Concur, this will be revised.

Please clarify the screening protocol for the 10 cubic yard cast piles. (A 10 cubic yard cast pile would be a 10-foot diameter by 10-foot high cone.) A description similar to that provided in the third and forth sentences of Section 9.5 for the waste characterization sampling is expected.

Response: The comment is noted.

14. p. 9-3, §9.5 Please revise the second sentence of the second paragraph to clarify the intent. Excavated soil that is placed in the stockpile area must either be placed in a stockpile that has not yet been characterized or into a new stockpile.

Response: Concur. The sentence will be revised.

15. p. 10-3, §10.7 The discussion in this section mentions the 200-foot buffer zone but does not mention the 100-foot buffer zone that the Navy said was also applicable to this site. Please explain.

Response: The 100 foot zone is applicable to the project. A note of the 200 foot zone is not found in this section.

16. p. 11-1,§11.0 The description of the Removal Action shall also include drawings showing where removals occurred (based on survey data), dimensions for each excavation location, descriptions of materials removed at each excavation, and discussion of materials (e.g., pipes, structures, concrete) left in place and where these materials are located.

Response: Concur, this information will be provided as recorded.

17. Figure 1-1 This figure previously depicted the 200-foot buffer zone associated with tidal waters but did not depict the 100-foot buffer zone that the Navy said was also applicable to this site and work plan. Now however, neither buffer zone is depicted on this or any other figure in the work plan. Please explain or revise the figure to include the boundary of each applicable buffer zone.
The extent of contamination depicted in this figure is not accurate because it does not include sampling results obtained before 2003 and the shading incorrectly identifies the contamination level of some samples at the selected kriging slice elevation, presumably owing to limitations in the kriging process. Furthermore, by only including one kriging elevation, greater contamination concentrations that exist at some locations are not identified. However, there are no locations omitted that are known to exceed the 30,000 ppm TPH threshold. This figure should more accurately depict historical results if it is included in future reports.

Response: The Kriging slice presented was selected as it provides the largest extent of contamination of petroleum in the soil based on the best data available in 2005. Additionally, it is provided only for informational purposes as the excavation is not targeted for this petroleum. Thus there is no reason to change the depiction in this work plan.

18. Figure 1-3 Please note that Foundation 1, shown as a red box on this figure, very likely corresponds with the simulated ship structures identified as buildings 134 (based on TP1C and TP-10) and 135 (based on TP1A and TP1B) and when these structures are excavated the proposed haul road would be destroyed. The temporary storage area as well as the support trailer should be located somewhere where no historical subsurface structures were located because EPA is interested in investigating these locations during this removal action.

Response: The comment is noted. Using the best information possible, the haul road will be established in an area that is not likely to be impacted by excavation.

Based on the proposed locations shown in this figure, the temporary staging area is located directly above historical structures and the haul road immediately abuts the two historical fuel storage tanks, located near TP-12 and TP-11, all of which EPA expects to investigate. It would be best to locate the support facilities and haul road on the western portion of the site.

Response: The comment is noted. Using the best information possible, the haul road will be established in an area that is not likely to be impacted by excavation.

19. Appendix F pp. 11 & 12 *EPA will work with RIDEM and the Navy regarding the location and size of the approximately ten additional excavations required to further assess areas of concern at the OFFTA site. EPA is interested in the former oil-water separators and fuel storage tanks and associated piping that are not addressed by the scope of work proposed by the Navy. While EPA agrees that some limitation on the size of these additional excavations is warranted, the purpose of these excavations will be to determine the presence or absence of these structures and the potential for residual TPH contamination in excess of the 30,000 ppm threshold. Because the exact location of these structures is not known, the excavations will have to be constructed to provide the best opportunity to find the structures or confirm that they are no longer present. As such, any limitations on these excavations will be understood to be guidelines only. If funding restrictions prevent an adequate investigation of these areas of concern then further investigations can be postponed until additional funding is acquired.*

Response: The comment is noted.

21. pp. 14-16 *Review of the historical drawings in conjunction with the previously conducted subsurface exploration locations (see Figure 1-3) indicates that: 1) Foundation #1 is apparently the remnants of both building 134 and 135; 2) Foundation #2 is the remnant of one of the two oil-water separators used to treat water discharged from the training structures; and 3) Foundation #3 is one of five fuel storage tanks used to provide fuel to the various training stations. As such, the estimated size of the structures appears correct (based on historical drawings) for Foundations #2 and #3, but is too small for Foundation #1.*

Response: The Comment is noted. Any additional information gathered on the features prior to demolition of the training area will be utilized to direct excavations accordingly.

ATTACHMENT B
RESPONSES TO COMMENTS FROM THE RIDEM TO THE
DRAFT FINAL REMOVAL ACTION WORK PLAN
OLD FIREFIGHTING TRAINING AREA
NAVSTA NEWPORT, NEWPORT RI
COMMENTS DATED JUNE 29, 2007

General Comments:

As the Navy is aware, while the Office of Waste Management fully supports the removal of contaminated soil, and surface and subsurface structures at the site, it is this Office's position that the proposed limited scope of the remedial effort in terms of contaminants of concern and remedial endpoints does not meet the State's regulatory requirements, as outlined in Section 8 of the Site Remediation Regulations, as well as, the applicable requirements of the Oil Pollution Regulations and the Leaking Underground Storage Tank Regulations. Accordingly, in order to achieve compliance with State regulations the Navy needs to expand the remedial effort.

The Office of Waste Management also questions the Navy's proposed approach, as it will necessitate the need to conduct additional Risk Assessments and Feasibility Studies, which will further delay addressing this site under the Federal Facilities Agreement. Finally, be advised as the proposed limited action fails to meet State regulatory requirements, the Office of Waste Management may take regulatory action against the Navy to ensure compliance with State regulations independent of the current CERCLA process.

Response: As stated in prior correspondence, the Navy is pursuing the approach that was presented at the Tiger Team meeting held April 13, 2006 at which RIDEM was represented. The limitations of the effort were explained at that time, particularly in regards to removal of metals that are naturally occurring and in regards to the pursuit of petroleum, which is not actionable under CERCLA. The removal action is being conducted to address petroleum at concentrations above UCLs, and to remove structures that may be continuing sources of contamination. The Navy fully understands that the pursuit of this removal will not preclude any future remedial efforts that are found to be required during the revision of the FS. As such, the Navy would suggest that RIDEM not take any further regulatory action against the Navy with respect to the OFFTA site until the Navy has had a chance to complete the CERCLA process in order to determine which, if any, regulatory issues still remain.

RIDEM must understand that this is a removal action and is not intended, at this time, to be the final remedy for the site. That determination will be discussed as part of the upcoming FS that is currently being developed. Please note that the Navy recognizes RIDEM's opinion regarding this matter.

Specific Comments:

1. Section 2-4, Regulatory Agency Personnel Site Visits
Page 24

As has been done in other work plans please include a statement concerning regulatory notification of field activities. Typically one-week notification is given prior to the start of activities, when possible 24-hour notification is given for the cancellation of activities. Further, since work schedules are dynamic a weekly schedule of upcoming activities is emailed to the regulators. Finally, the entity responsible for notifying the regulators must be specified in the work plan.

Evaluation of Response and Draft Final Report

Comment has been addressed.

2. Section 4.0, Regulatory Objectives
Page 4.0

Please modify the report to include all of the Site Remediation Regulations, not just Section 8

Evaluation of Response and Draft Final Report

Navy has stated that they will not expand the list of contaminants. Please be advised that by this stance the Navy will not meet the requirements of the Site Remediation Regulations.

Response: Please refer to the response to the general comments above. RIDEM must understand that this is a removal action and is not intended, at this time, to be the final remedy for the site. That determination will be discussed as part of the upcoming FS that is currently being developed. Please note that the Navy recognizes RIDEM's opinion regarding this matter.

3. Section 4.0, Regulatory Objectives
Page 4.2

"Rhode Island UST and LUST requirements- Underground tanks and support systems will be removed."

Please modify the above as follows:

Rhode Island UST and LUST requirements- Underground tanks and support systems will be removed in accordance with these requirements.

Evaluation of Response and Draft Final Report

Navy has stated that they will remove UST in accordance with procedures describe in the work plan. Please be advised that by this stance the Navy will not meet the requirements of the Underground Storage Tank Regulations, and the Oil Pollution Control Regulations.

Response: The RIDEM is referred to the Navy's correspondence dated November 6, 2006 in regards to the interpretation of NAPL. Please also refer to the response to the general comment above.

4. Section 5.0, Removal Overview
Page 5.0

The proposed clean up criteria for petroleum is conditions, which exceed the UCL. Accordingly, the report should note that free product in the soil and groundwater will also be removed.

Evaluation of Response and Draft Final Report

The response and draft final document states that only mobile NAPLs will be addressed. Please be advised that by this stance the Navy will be in violation of the Oil Pollution Control Regulations, the Site Remediation Regulations and the Leaking Underground Storage Tank Regulations.

Response: The RIDEM is referred to the Navy's correspondence dated November 6, 2006 in regards to the interpretation of NAPL. Please also refer to the response to the general comment above.

5. Section 5.0, Removal Overview
Page 5.0

The proposed clean up criteria for the site will not address concerns associated with petroleum contamination below the UCL or the presence of other contaminants such as lead. Accordingly, at this time the Office of Waste Management does not concur with the proposed clean up standards and additional remediation will be required.

Evaluation of Response and Draft Final Report

The Navy has acknowledge that the remedial action will not meet RIDEM requirements.

Response: The comment is noted. Please refer to the response to the general comment above.

6. Section 5.0, Removal Overview
Page 5.0

This section of the report deals with the removal of subsurface structures. The report states that if evidence of petroleum contamination is encountered the structure and any associated structure will be removed. It was the Office of Waste Management understanding that all underground structures are to be removed. Please modify the report to reflect this requirement.

Evaluation of Response and Draft Final Report

It is agreed that concrete or pipes, which is not contaminated or does not have contaminated soil adjacent to it can remain in place. To this end please modify Figure 5-1 to state that all pipes will be tracked and sampled to determine if contamination is present. Further, the report states that continuing sources of contamination will be removed. This may cause confusion in the field. As an illustration an intact tank or vault full of oil, which has not leaked, is not a continuing source of contamination. To avoid this problem in the field simply state that all structures, pipes, soil, etc which exceed criteria will be removed.

Response: All pipes, which could include water pipes, sanitary pipes, electrical conduit, as well as fuel lines should not need to be tracked, sampled and removed. The goal of this removal action is not to perform "housekeeping" activities that are more appropriately handled by the Installation.

The Navy concurs that any vault, tank, or void full of oil that has not leaked is a potential source of contamination and will be removed.

7. Section 5.0, Removal Overview
Page 5.0

The report states that if evidence of petroleum contamination is encountered the structure and any associated structure will be removed. If it is the Navy's intent to remove underground objects based upon field observations it will be necessary to inspect the entire underground object. As an illustration if a pipe is encountered, using the above criteria it will be necessary to inspect the length of the pipe for oil contamination. Further, in certain situations, visual observations alone will not be sufficient to ascertain if petroleum contamination is present. As an illustration, soil in a pipe may contain concentrations of TPH above the criteria for the removal action. Therefore, the work plan must stipulate that the entire underground object will be inspected and samples will be collected and analyzed as necessary to confirm the presence of contamination.

Evaluation of Response and Draft Final Report

It is agreed that all underground structures and pipes will be inspected and sampled and removed as necessary. The statements that the removal action will be limited to items and structures, which are anticipated to be source of contamination, may cause confusion in the field. As an illustration, an old sewer line may have served as a preferential pathway for contaminants and the soil around it may exceed criteria and soil therefore must be removed, even though the line never was anticipated to be a source of contamination.

Response: The comment is noted. Use of the decision tree provided as Figure 5-1 will address findings that are unpredictable at this time.

8. Section 5.0, Removal Overview
Page 5.0

Based upon the information provided in this report the underground structures to be removed in addition to the ones cited, include the four underground storage tanks associated with the above ground oil tanks and Christmas trees, the oil tank north of Building 144 which is connected to the two structures (oil water separators?) on the southern end of the site, the pipes from Building 133 and 132 which connect to the aforementioned oil water separator. Areas which the work plan mentioned but was not clearly identified in the figure include the two oil water separators, and the manifold piping system from the ASTs and Christmas trees, which discharged into the oil water separators.

Evaluation of Response and Draft Final Report

The intent of the comment was simply to note potential source areas in the report.

Response: The comment is noted.

9. Section 5.0, Removal Overview
Page 5.0

A review of historical plans and aerial photographs of the site will assist in the demarcation of potential areas of concern. Please provide historical plans for all of the former structures at the site and aerial photographs available from the engineering office at Naval Station Newport. In addition please indicate what was the function of Buildings 126, 130, 131. and 137.

Evaluation of Response and Draft Final Report

The Navy has addressed the comment.

10. Section 5.0, Removal Overview
Page 5.0

The report notes that ten test pits will be dug to ascertain the locations of suspect underground structures. The work plan also calls for the removal of the manhole structure and any associated piping. This structure appears to be part or a remnant of the former concrete pad, which housed the AST and Christmas trees. If a sufficient portion of this remnant is still in place, removal of the associated piping may lead to other underground structures such as the oil water separators or USTs. Therefore the report must specify that prior to removing this remnant, the extent of the remnant will be uncovered. Then soil will be excavated along the perimeter of the remnant to a depth sufficient to locate buried pipes which leads to other structures such as the oil water separators, USTs, etc. These pipes or other structures will be tracked prior to the removal of the remnant. If piping is not present the outline of the remnant can still be used to locate other structures, such as the underground storage tanks, oil water separators, etc. This will

necessitate taking measurements from the perimeter of the remnant (both GPS and scaled field measurements from existing structures) prior to its removal. This information will be used along with the historic scaled plans to outline the extent of the concrete pad and possible locations for the underground structures.

Evaluation of Response and Draft Final Report

Please revise the work plan to state that prior to removing this remnant, the extent of the remnant will be uncovered. Then soil will be excavated along the perimeter of the remnant to a depth sufficient to locate buried pipes which leads to other structures such as the oil water separators, USTs, etc. These pipes or other structures will be tracked prior to the removal of the remnant. If piping is not present the outline of the remnant can still be used to locate other structures, such as the underground storage tanks, oil water separators, etc. This will necessitate taking measurements from the perimeter of the remnant (both GPS and scaled field measurements from existing structures) prior to its removal. This information will be used along with the historic scaled plans to outline the extent of the concrete pad and possible locations for the underground structures.

Response: See response to Comment 6 plus planned utilization of the flow chart for decision-making purposes provided in the work plan.

11. Section 5.0, Removal Overview
Page 5.0

The report notes RIDEM will be consulted to determine the location of test pits. It is likely that removal of the remnant and the associated piping will lead to a number of the USTs, the drainage to the oil water separators and the drainage associated with Building 133 and 132, as well as Buildings 132, 133 and 134. If this is the case, these area, will not have to undergo test pit investigation. At this time areas which require test pitting include: USTs not associated with remnant of the pad and the large circular concrete structure immediately west of the pad, visible in aerial photographs demolition of the site. Additional locations will be provided after the requested material in this comment package is provided.

Evaluation of Response and Draft Final Report

The Navy has addressed the comment.

12. Section 5.0, Removal Overview
Page 5.0

The location of the various structures is depicted in numerous scaled engineering drawings and aerial photographs. Unfortunately it is not known whether any of the drawings reflect as built. Therefore, the Navy must determine the location of these structures in the field based upon information from both the scaled drawings and the aerial photographs. The locations will be demarcated using GPS and direct ground field measurements from structures still existing on the site (as an illustration the distance from the remnant of the pad and the former day care building will be measured in the field and compared to historical engineering plans). Finally, a metal detector must be employed to fine-tune the location of objects in the field.

Evaluation of Response and Draft Final Report

The intent of the comment was to employ standard practices when performing the removal action. If one has scaled engineering drawings one routinely takes measures from known sites to see if the scaled drawing reflects site conditions. In regards to a metal detector this is a low cost tool, which is routinely used by responsible parties to locate pipes and tanks.

Response: Use of a metal detector can lead to numerous false positives which result in wasted labor and equipment costs. If pipes are tracked, they will be tracked using the historic drawings and findings on the ground.

13. Section 7.4.1, Non Aqueous Phase Liquids
Page 7-4, Paragraph 6.

"The presence of sheen on standing water is not considered as a measurement of NAPLs. Measure NAPLs is anticipated to be the thickness of liquid ¼ or greater measured by the oil water interface probe Appendix F."

Sheen is considered NAPLs therefore please remove the above and the procedures outlined in Appendix F

Evaluation of Response and Draft Final Report

As stated in previous correspondence NAPLs are not limited to measurable product via an oil water interphase probe. Therefore the presence of NAPLs in any media is considered an exceedance of UCLs. The proposal to use pumping, absorbent pads booms etc is acceptable to control NAPLs observed on water during construction. Removal or other measures are necessary to address sources of NAPLs. If this action is not taken the proposed remedial action will not meet the Navy's stated objective of remediating to UCLs.

Response: Please refer to the response to the general comment above.

14. Section 7.4.1, Non Aqueous Phase Liquids
Page 7-5, Paragraph 3.

"The process will be repeated at the Navy's discretion if NAPLs continue to accumulate."

Please add the following to the above

To address this problem additional excavation will have to be performed.

Evaluation of Response and Draft Final Report

The Navy has stated that if sidewall samples exceed 30,000 ppm in an area where free product is observed the excavation will continue. Please be advised that due to geology, type of oil, etc. free product may be generated at TPH concentrations below 30,000 ppm. In recognition of this fact the UCL has provisions for free product independent of TPH concentrations. Therefore, it is inappropriate to rely solely on the 30,000 ppm criteria and source removal should continue until the NAPL problem has been addressed. It appears that he Navy will conduct additional removal actions up to three cycles before installing crush stone. Please confirm.

Response: In regards to determining the presence of NAPL, please refer to the response to the general comment, above. It is confirmed that three cycles of NAPL removal will take place prior to backfilling with stone, as stated in the work plan.

15. Section 7.7, Backfill
Page 7-6, Paragraph 3.

The Navy has agreed to backfill with crushed stone as to allow for infiltration galleries, etc. Please modify this section accordingly.

Evaluation of Response and Draft Final Report

The Navy has proposed backfilling with crushed stone at all locations where free product has not been addressed by the remedial action. It is strongly recommended that all areas exceeding the remedial the RIDEM direct exposure criteria for TPH be backfilled with crushed stone, as this would allow for the low cost remedial alternatives such as insitu oxidation, to be employed at a later date. Please be advised that if the Navy elects not to take advantage of the opportunity to backfill these areas with crush stone at this time, the Navy cannot use cost associated with reexcavating these areas to place crush stone in them as a factor in a future Feasibility Study.

Response: The comment is noted.

16. Section 9.2, Confirmatory Sampling
Page 9.1, Paragraph 3

"A PID reading less then 100 PPM will indicate that "

Typically a 20 ppm criteria is employed therefore please modify the above as follows:

A PID reading less then 20 PPM will indicate that

Evaluation of Response and Draft Final Report

Navy has addressed the comment.

17. Section 9.2, Confirmatory Sampling
Page 9.1, Paragraph 3

Field screening with a PID is typically conducted at horizontal intervals of one every five horizontal feet with each sidewall being field screened. Please include requirement in the report.

Evaluation of Response and Draft Final Report

Navy has addressed the comment.

18. Section 9.2, Confirmatory Sampling
Page 9.1, Paragraph 3

At the Tank Farms and other sites at NETC where petroleum contamination was present field screening with Petro Flag kits or immuno assay were employed. These kits greatly facilitated the removal process. Therefore, please include the use of TPH field kits in the removal work plan.

Evaluation of Response and Draft Final Report

Navy has addressed the comment.

19. Section 9.2, Confirmatory Sampling
Page 9.1, Paragraph 4

The work plan proposes collecting confirmatory samples at a rate of one sample per 20 linear feet. Although not stated it is assumed that it was the intent to test every sidewall. Therefore in order to avoid confusion in the fields please modify the work plan to state that each sidewall will undergo confirmatory sampling.

Evaluation of Response and Draft Final Report

Navy has addressed the comment.

20. ***Section 9.2, Confirmatory Sampling***
Page 9.1, Paragraph 4

"Bottom samples will be collected on a 20 foot grid"

Please modify the above as follows:

Bottom samples will be collected on a 10-foot grid

Evaluation of Response and Draft Final Report

Navy has addressed the comment.

21. ***Section 9.2, Confirmatory Sampling***
Page 9.1, Paragraph 4

"In addition the standing water in the excavation will be evaluated to ensure that no NAPLs remains."

The above implies that measures will be taken to ensure the free product is not present in the standing water. Please be advised that free product must also be removed from the soils and sediments. Therefore please revised the report to state that free product in soils, sediments and groundwater will be removed.

Evaluation of Response and Draft Final Report

Navy has not addressed the comment.

Response: Please refer to the response the general comment, above.