FINAL PROPOSED PLAN FOR OPERABLE UNIT 2 (OU 2) NSY PORTSMOUTH ME

07/01/2011

NAVFAC MID ATLANTIC

Proposed Plan

Operable Unit 2

Portsmouth Naval Shipyard, Kittery, Maine

THE CLEANUP PROPOSAL

This Proposed Plan has been prepared in accordance with federal laws to give the Navy's preferred approach for addressing contaminated soil at Operable Unit (OU) 2, Portsmouth Naval Shipyard (PNS), Kittery, Maine. OU2 includes Site 6 – the Defense Reutilization and Marketing Office (DRMO) Storage Yard, Site 29 - the Former Teepee Incinerator Site, and the DRMO Impact Area. The types and concentrations of contaminants at Site 6 and the western portion of Site 29 are similar; therefore, the areas were combined for analysis as part of the DRMO area. The remainder of Site 29 was evaluated as the waste disposal area (see Figure 1). Contaminated soil in the DRMO Impact Area was addressed as part of the 2010 removal action (see Page 6).

After careful study, the Navy, with concurrence from the United States Environmental Protection Agency (EPA), proposes:

- No Further Action for the DRMO Impact Area.
- Excavation and disposal of contaminated soil associated with unacceptable risk based on current industrial land use in the DRMO area.
- Excavation and disposal of surface soil and construction of a soil cover in the waste disposal area.
- Implementation of **Land Use Controls (LUCs)**.
- **Monitoring** of **groundwater** and sediment accumulation.
- Performance of five-year reviews to ensure continued protectiveness.

This plan provides information on the remedial alternatives evaluated for impacted soil, the public comment period, the informational open house and public hearing, and how the final remedy for OU2 will ultimately be selected.

LET US KNOW WHAT YOU THINK

Mark Your Calendar!

PUBLIC COMMENT PERIOD

JULY 21, 2011, TO AUGUST 19, 2011

The Navy will accept comments on the Proposed Plan for OU2 during this comment period. You do not have to be a technical expert to comment. To provide comments, you may speak during the public hearing or provide written comments at either the informational open house and public hearing or by fax or mail. Written comments postmarked no later than August 19, 2011, should be sent to:

Ms Danna Eddy
Public Affairs Office (Code PAO100)
Portsmouth Naval Shipyard,
Portsmouth, New Hampshire 03804-5000

Fax: (207) 483-1266

Informational Open House
AND PUBLIC HEARING

AUGUST 10, 2011

The Navy invites you to attend an informational open house from 6 pm to 8 pm to learn about the proposed OU2 cleanup plan and how it compares with other cleanup options for the site. The informational session will include posters describing the Proposed Plan and an informal question and answer session. A formal public hearing will follow from 8 to 8:30 pm, in which the Navy will receive comments on the Proposed Plan from the public. It is at this formal hearing that an official transcript of the comments will be recorded. The above activities will be held at the Kittery Town Hall in Kittery, Maine.

*Federal and state environmental laws govern cleanup activities at federal facilities. A federal law called the **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)**, better known as Superfund, provides procedures for investigation and cleanup of environmental problems. Under this law, the Navy is pursuing cleanup of designated sites at PNS to return the property to a condition that protects the community, Shipyard workers, and the environment.*

TECHNICAL TERMS USED THROUGHOUT THIS PROPOSED PLAN ARE EXPLAINED IN THE GLOSSARY OF TERMS ON PAGE 18

INTRODUCTION

This Proposed Plan provides information on the preferred approach for addressing contaminated soil at OU2 at PNS and provides the rationale for this preference. In addition, this plan includes summaries of other cleanup alternatives evaluated for use at this site. This document is issued by the Navy, as the lead agency for all investigations and cleanup programs ongoing at PNS, and the EPA, with the concurrence of Maine Department of Environmental Protection (MEDEP). The Navy and EPA, in consultation with MEDEP, will select a final remedy for the site after reviewing and considering all information submitted during the 30-day public comment period and may modify the Preferred Alternatives or select another response action presented in this plan based on new information or public comments. Therefore, the public is encouraged to review and comment on all of the alternatives presented in this Proposed Plan, not just the preferred alternatives.

The Navy is issuing this Proposed Plan as part of its public participation responsibilities under Section 300.430(f)(2) of the **National Oil and Hazardous Substances Pollution Contingency Plan (NCP)**. The Proposed Plan summarizes information that can be found in greater detail in the Supplemental **Remedial Investigation (RI)**, **Feasibility Study (FS),** and other documents included in the PNS Information Repositories, which are located at the Rice Public Library in Kittery, Maine, and the Portsmouth Public Library in Portsmouth, New Hampshire. The Navy and EPA encourage the public to review these documents to gain a more comprehensive understanding of the site and associated environmental activities. Please refer to the Next Steps section on Page 13 for contact information and phone numbers for these facilities.

The purpose of this Proposed Plan is to:

- Provide the public with basic background information about PNS and OU2. This information includes a description of the operable unit that was developed by reviewing past documents, investigating soil and groundwater, and evaluating potential human and ecological impacts.
- Describe the cleanup options that were considered.
- Identify the Navy's Preferred Alternatives for remedial action and explain the reasons why these alternatives are the Navy's preferred choice.
- Provide information on how the public can be involved in the remedy selection process.
- Encourage review of the Proposed Plan by the public.

After the public has had the opportunity to review and comment on this Proposed Plan, the Navy will summarize and respond to all significant comments received during the comment period in the Responsiveness Summary.

The Navy and EPA, in consultation with MEDEP, will carefully

History of Site Investigations and Interim Actions

1984 through 1998: Environmental samples were collected at OU2 as part of various investigations including the Final Confirmation Study (FCS) in 1984, **Resource Conservation and Recovery Act (RCRA)** Facility Investigation (RFI) in 1989 to 1992, RFI Data Gap Investigation in 1994, groundwater monitoring from 1996 to 1997, and Field Investigation at Site 29 in 1998.

1992 – Onshore Ecological Risk Assessment: Conducted for three areas at PNS including the DRMO Storage Yard to determine risks to onshore ecological receptors.

1993 – Interim Corrective Measures at the DRMO Storage Yard: Conducted to cover (with an **interim cap** or pavement) areas of exposed contaminated soil to minimize surface runoff of soil contaminants.

1999 – Removal Action at Site 6: Conducted to stabilize the shoreline along the DRMO Storage Yard.

2000 – Revised OU2 Risk Assessment: Calculated and evaluated human health risks for different land use scenarios at OU2 using updated risk assessment guidance and data collected since the initial 1994 risk assessment.

2004 and 2005 – Soil Washing Treatability Study for OU2: Large-volume soil samples were collected from five test pits, and a **soil washing treatability study** was conducted on the soil samples to support evaluation of remedial action for OU2 soil.

2005 – Removal Action at Site 6: Conducted to stabilize the shoreline between the DRMO Storage Yard and the area west of the seawall at Site 29.

2006 – Removal Action at Site 29: Conducted along the shoreline east of the seawall at Site 29. Surficial debris in the wooded area in the eastern portion of Site 29 was removed, and the area was covered with gravel.

2007 and 2008 – OU2 Additional Investigation: Conducted to refine the nature and extent of contamination through collection of soil, groundwater, and surface water samples and test pitting.

2008 – Shoreline Stabilization Upgrades: Conducted to provide additional stabilization of the shoreline at Site 29 west of the seawall.

2010 – Supplemental RI: Summarized the results of previous investigations and risk assessments for OU2 and updated the site characterization, nature and extent of contamination, and site risks based on the OU2 Additional Investigation conducted in 2007 and 2008 and shoreline removal action activities conducted since 2005.

2010 – Removal Action for DRMO Impact Area: Conducted to remove lead- and copper-contaminated soil from the DRMO Impact Area portion of OU2.

2011 – FS: Conducted to develop and evaluate potential cleanup alternatives for OU2.

consider all comments received and could even select a remedy different from that proposed in this Plan. Ultimately, the selected remedy for OU2 will be documented in a **Record of Decision (ROD)**. The Responsiveness Summary will be issued with the ROD.

Site Background

PNS is a military facility with restricted access located on an island in the Piscataqua River. The Piscataqua River is a tidal estuary that forms the southern boundary between Maine and New Hampshire. PNS was established as a government facility in 1800, and it served as a repair and building facility for ships during the Civil War. The first government-built submarine was designed and constructed at PNS during World War I. A large number of submarines have been designed, constructed, and repaired at this facility since 1917. PNS continues to service submarines as its primary military focus.

Where is OU2 within the Shipyard?

OU2 is located in the south-central portion of PNS along the Piscataqua River.

For what was OU2 used?

The majority of the OU2 area has been used for industrial activities since the 1920s. The portion of OU2 where Quarters S, N, and 68 are located has been used as residences since the 1800s.

The DRMO Storage Yard, Site 6, was used for activities associated with the reuse, transfer, donation, sale, or disposal of excess and surplus Department of Defense (DoD) property in New England. Materials reportedly stored at Site 6 included lead and nickel-cadmium battery elements, motors, typewriters, paper products, and scrap **metal**. Hazardous materials of concern were the lead battery cells and plates that were stockpiled on uncovered pallets. Nickel-cadmium batteries also were stored in this manner. Activities such as open storage of batteries and other materials that could have caused contaminants to be released were discontinued in approximately 1983. Scrap metal storage was conducted in Building 146 until 2000, and the building was demolished around 2003. DRMO activities were discontinued in 2010.

The main activities that occurred at Site 29, the Former Teepee Incinerator Site, were related to open burning, industrial incineration, and waste disposal. Open burning of trash was conducted in the waste disposal area from approximately 1918 until 1965, when the incinerator was built. The incinerator was used to burn trash, primarily wood, paper, household waste, and occasionally cans of paint and solvents until 1975. Ash from open burning and the incinerator was disposed in the waste disposal area.

Historically, DRMO Storage Yard operations primarily occurred inside the current fenced area but also may have occurred in adjacent areas. Snow plowing in the DRMO Storage Yard may have pushed small pieces of stored materials to adjacent areas, including the Quarters S and N area. Activities such as open storage of batteries and other materials, which could have caused contaminants to be **leached** or otherwise released by pathways such as infiltration or runoff, were terminated in approximately 1983. Open storage of scrap metal in large piles was discontinued before the **interim cap** was installed in 1993.

What is the current and future land use at the site?

The portion of OU2 that encompasses the fenced area south of Quarters S and N and west of Building 298 includes an asphalted area and a capped area. In 2010, remaining DRMO Storage Yard activities were moved to another location, and the asphalted area is not currently in use. The capped area (formerly used for DRMO operations) is covered by grass and barricaded (by jersey barriers) from use for any activities. There are no permanent buildings located in this area.

Two buildings are located in the Site 29 area; Building 298 is used for office space, and Building 310 is a hose-handling facility. There are no current hazardous waste-related activities at OU2, and hazardous chemicals are not used as part of any of the current operations at OU2. The DRMO Impact Area includes Quarters S, N, and 68 and a parking area west of Quarters X. The quarters are used by military personnel for generally 3- to 4-year tours of duty, although Quarters S and N are currently vacant.

Most of OU2 and adjacent areas are currently used for industrial activities (DRMO Storage Yard, dumpster storage area, Buildings 298 and 310, and the area west of the DRMO Storage Yard). The Shipyard does not have plans to change land use for these areas; industrial use of these areas is anticipated to continue. The northern portion of OU2 has military residences, and residential use is anticipated to continue in this area.

Site Characteristics

What does OU2 look like?

Site 6 is covered with asphalt and an interim cap. There is a grass cover over the interim cap. Jersey barriers run along the eastern and northeastern portion of the interim capped area, and a fence encompasses the remainder of the area to prevent access. The Building 298 area and waste disposal area at Site 29 are covered with grass (south, east, and north of Building 310), concrete, or asphalt and include Buildings 298 and 310. The DRMO Impact Area is a residential area (including Quarters S, N, and 68) covered with grass, houses, and roads.

Within the DRMO area, soil with an average thickness of 6 feet overlies a rock fragment fill layer with little soil. Within the capped area and west of Building 298, soil in some areas extends deeper than 6 feet. In the waste disposal area, a soil layer ranging in thickness from 2 to 10 feet overlies waste

material that ranges in thickness from 2 to 40 feet.

The OU2 shoreline along the Piscataqua River is steeply sloped and has an approximate length of 1,100 feet. The shoreline is protected from erosion by a seawall, riprap, and other erosion control devices. The seawall is approximately 300 feet long and 12 feet high and runs just east of Building 298 to the end of the point where the coastline angles to the southeast.

What is the size of OU2?

OU2 is approximately 7 acres, including 3 acres encompassing Site 6, 1 acre encompassing Site 29, and 3 acres encompassing the DRMO Impact Area.

How much and what types of chemicals are present?

Soil contaminants identified at Sites 6 and 9 are antimony, copper, lead, nickel, **dioxins/furans**, **polychlorinated biphenyls (PCBs),** and **polycyclic aromatic hydrocarbons (PAHs).** Lead was detected at concentrations greater than residential risk screening levels and **background** concentrations across the largest areas and therefore lead contamination defines the maximum extent of soil contamination at Sites 6 and 29. Soil contaminants were found at greatest concentrations within the current DRMO Storage Yard, capped area, and waste disposal area. Detection of lead greater than 15,000 parts per million (ppm) were found in soil in these areas. Outside of these areas, lead concentrations generally were less than 2,000 ppm. An area with slag (rock-like remnants of foundry operations) characterized as having elevated copper concentrations (greater than 10,000 ppm) was found in the area asphalted as part of the 1993 interim measures. Elevated copper concentrations were also found in the capped area and waste disposal area. Areas of soil with PCB concentrations greater than 10 ppm were found in the capped area and waste disposal area and in portions of the DRMO Storage Yard. The extent of DRMO contamination in the area west of the DRMO entrance (identified as the Pre-Design Investigation Boundary on Figure 1) has not been fully delineated. The Navy is conducting a pre-design investigation to better delineate contaminant concentrations in this area. The investigation results will be used to determine the specific portions of this area that will be included in the remedy for OU2.

In the DRMO Impact Area, lead- and copper-contaminated soil from past DRMO activities was identified in the backyards of Quarters S and N. This contamination was removed as part of the 2010 removal action.

Scope and Role of the OU2 Response Action

OU2 is one of several sites identified at PNS for assessment and cleanup under CERCLA. Each of these sites is undergoing the CERCLA cleanup process independently of each other. The Proposed Plan for OU2 is not expected to have an impact on the strategy or progress of cleanup for the other sites at PNS. As these other sites progress through the cleanup process, Proposed Plans will be issued for these sites.

Summary of Site Risks

As part of site investigation activities, the Navy completed human health and ecological risk assessments to evaluate current and future effects of chemicals detected at the site on human health and the environment. The results of these assessments are described below.

Human Health Risks

The EPA **Human Health Risk Assessment (HHRA)** estimates the baseline risk, which is the likelihood of health problems occurring if cleanup actions were not taken at the site. The HHRA evaluated potential exposure to chemicals in soil at Site 6, Site 29, and the DRMO Impact Area and groundwater at OU2 as a whole. The site areas were considered individually when calculating risks. To estimate the baseline risk for humans using the EPA HHRA methodology, a four-step process was used.

Step 1 – Identify Chemicals of Potential Concern (COPCs)

COPCs are chemicals found at the site at concentrations greater than risk-based screening criteria (and for select organic compounds and metals greater than facility background levels). The COPCs were further evaluated in Steps 2 through 4 of the risk assessment.

Step 2 – Conduct an Exposure Assessment

In this step, the many ways that people could come into contact with soil and/or groundwater at OU2 were considered. Both current and future exposure scenarios were identified. Current and future construction workers, industrial workers, recreational users, and military residents were evaluated for potential exposure to contaminants.

For Site 6, the only current exposure would be for a construction worker exposed to surface and subsurface soil during construction activities. Risks to industrial workers exposed to surface soil would be of concern if the asphalt or interim cap were removed. For the remainder of OU2, excluding the DRMO Impact Area, industrial exposure to surface soil and construction worker exposure to surface and subsurface soil are the major potential exposure concerns. Future residential use of the Sites 6 and 29 areas only could occur under a potential future site development scenario. The DRMO Impact Area includes three military residences and a parking area; therefore, current uses are residential and industrial. The assumed exposure routes included ingestion of and dermal (skin) contact with surface and subsurface soil and inhalation of air/dust particulates and vapors from volatiles in surface and subsurface soil.

Groundwater at OU2 is saline/brackish and is not suitable for human consumption. Therefore, residential exposure to

groundwater was not evaluated in the risk assessment. Construction worker exposure to groundwater was evaluated based on the assumption that workers may come into contact with groundwater via dermal (skin) contact or inhalation of volatiles from contaminated groundwater during excavation or utility line repair activities.

Step 3 – Complete a Toxicity Assessment

At this step, possible harmful effects from exposure to the individual COPCs were evaluated. Generally, these chemicals are separated into two groups, carcinogens (chemicals that may cause cancer) and non-carcinogens (chemicals that may cause adverse effects other than cancer). Lead is not evaluated in the same manner as most other chemicals and therefore was assessed separately.

Step 4 – Characterize the Risk

The results of Steps 2 and 3 were combined to estimate the overall risk from exposure to chemicals at OU2. The terms used to define the estimated risk are explained in the text box, ***What is the Potential Risk to Me?***

The results of the HHRA for people potentially exposed to soil at Site 6 indicated that unacceptable non-carcinogenic risks were primarily attributable to antimony, copper, and PCBs (Aroclor-1254). Non-carcinogenic hazard indices for construction workers, industrial workers, child recreational users, future adult residents, and future child residents exceeded the target goal. Unacceptable carcinogenic risks for Site 6 soil were primarily attributable to the PAH benzo(a)pyrene and the PCB Aroclor-1254. Cancer risk estimates for future resident exposure to soil exceeded the target risk range, and calculated lead risks exceeded EPA benchmarks for all **receptors** evaluated.

The results of the HHRA for people potentially exposed to soil at Site 29 indicated that unacceptable non-carcinogenic risks are primarily attributable to antimony. The **hazard index** for construction workers exceeded the target goal. Unacceptable carcinogenic risks for Site 29 soil were primarily attributable to PAHs. Cancer risk estimates for all potential receptors exposed to surface and/or subsurface soil were within the EPA target risk range. The cancer risk estimates for construction workers, industrial workers, adult and child recreational users, and hypothetical future residents exceeded the State of Maine risk guideline. Calculated lead risks exceeded USEPA benchmarks for construction workers and child residents.

Because copper- and lead-contaminated soil at the DRMO Impact Area was removed as part of the 2010 removal action, there are no longer unacceptable risks to people exposed to soil at the DRMO Impact Area.

No unacceptable risks were found from construction worker exposure to groundwater at OU2.

What is the Potential Risk to Me?

In evaluating risks to people, risk estimates for carcinogens (chemicals that may cause cancer) and non-carcinogens (chemicals that may cause adverse effects other than cancer) are expressed differently.

For carcinogens, risk estimates are expressed in terms of probability. For example, exposure to a particular carcinogenic chemical may present a 1 in 10,000 chance of increasing the current cancer risk over an estimated lifetime of 70 years. This can also be expressed as $1x10^{-4}$. The EPA acceptable risk range for carcinogens is within $1x10^{-6}$ to $1x10^{-4}$ or a one in a million to a 1 in 10,000 chance of an increase in cancer risk. Cleanup would be considered for calculated risks greater than the acceptable risk range.

For non-carcinogens, exposures are first estimated and then compared to a reference dose (RfD). The RfD is developed by EPA scientists to estimate the amount of a chemical a person (including the most sensitive person) could be exposed to over a lifetime without developing adverse (non-cancer) health effects. This measure is known as a hazard index. A hazard index greater than 1 suggests that adverse effects are possible.

Exposure to lead is evaluated by using blood-lead concentration as a biomarker. Environmental exposures to lead are modeled using the EPA's Integrated Exposure Uptake Biokinetic (IEUBK) Model and EPA's Technical Review Workgroup (TRW) Adult Lead Model to predict blood-lead levels associated with those exposures. The goal of the EPA is to limit the risk of exceeding a 10 microgram per deciliter (µg/dL) blood-lead concentration to 5 percent of the population.

Ecological Risks:

The primary objective of the screening-level **ecological risk assessment (ERA)** was to evaluate whether ecological receptors are potentially at risk when exposed to chemicals at OU2. The screening-level ERA was completed in three steps, as follows.

Step 1 – Problem Formulation

In this step, the ERA evaluated whether ecological receptors are able to exist and grow in similar ways at the site and in the surrounding area. Actual or potential exposures of ecological receptors were determined by identifying the most likely pathways of contaminant release and transport. A complete exposure pathway has three components: (1) a source of chemicals that can be released to the environment, (2) a route of contaminant transport through an environmental medium, and (3) an exposure or contact point for an ecological receptor. The complete exposure pathways and routes of entry into plant

and animal life at OU2 (in unpaved portions where vegetation is present) consist of:

- Direct contact with soil by plants.
- Direct contact with and inhalation and ingestion of contaminants by terrestrial animals (e.g., rodents)

Step 2 – Risk Analysis

In this step, possible harmful effects from being exposed to the individual COPCs were evaluated. This step included estimating or measuring the amount of each COPC in soil and groundwater and then evaluating ecological receptor exposure to these chemical concentrations.

Step 3 – Risk Characterization

In this step, the results of the risk analysis were analyzed to determine the likelihood of harmful effects to ecological receptors at OU2. Based on the risk characterization, the general conclusions were that the habitats observed were typical of developed areas and indicated that the ecological communities present in the onshore areas of OU2 were healthy and viable. No onshore ecological risks are attributed to OU2 because most of the site is in an industrial area and covered, and there is little habitat in the contaminated areas for exposure of ecological receptors. Potential offshore ecological risks associated with past releases from OU2 are being evaluated as part of the OU4 investigation. Potential future releases, if shoreline controls were to fail in the future and contaminated soil eroded to the offshore, could result in unacceptable risks to the offshore from copper, lead, and nickel contamination in soil.

Why is action needed at the site?

As a result of past activities at OU2, antimony, copper, lead, nickel, PAH, and PCB contamination is present in soil at concentrations that could result in unacceptable human health risks if action is not taken to prevent exposure to the contaminated soil.

In addition to human health risks at the site, there are concerns associated with impacts to the offshore from erosion and uncertainty as to the long-term stability of the shoreline controls placed along the OU2 shoreline. Past releases from OU2 that impacted sediment in the offshore area of OU2 are being addressed as part of a different site (OU4); therefore, any remedial action required for sediment in the OU2 offshore area (including monitoring) will be evaluated as part of OU4.

Finally, there are future potential risks for contaminant migration to the offshore. Migration of groundwater off site does not pose unacceptable risks based on current conditions. However, contamination in the capped area (lead, copper, and nickel) could migrate from soil in the **unsaturated zone** to groundwater if the impermeable cap were removed and water precipitated through highly contaminated soil remaining in the capped area.

It is the current judgment of the Navy and EPA, in consultation with MEDEP, that removal of contaminated soil, combined with LUCs and monitoring, is necessary to protect public health and welfare from actual or threatened releases of these hazardous substances into the environment, and that the Preferred Alternatives are the appropriate remedial alternatives for this purpose. A removal action was completed at the DRMO Impact Area that addressed all unacceptable risks; further action is not required in this portion of OU2.

DRMO Impact Area Removal Action

Remediation of soil contamination in the DRMO Impact Area was evaluated in a 2009 Engineering Evaluation/Cost Analysis (EE/CA) that compared removal action alternatives to address risks resulting from lead- and copper-contaminated soil. The removal action objective identified in the EE/CA was to remove contaminated soil in the DRMO Impact Area to eliminate potential unacceptable human health and environmental risks so that the property can be used without any site restrictions (i.e., unrestricted use/unlimited exposure). In the EE/CA, the Navy evaluated a "no action" alternative, as required under CERCLA, and a soil excavation alternative involving removal and offsite disposal of contaminated soil and restoration of the excavated area. The Navy recommended the soil excavation alternative, and no comments were received on the recommendation during the public comment period. The Action Memorandum for the removal action was signed in November 2009, and the removal action was implemented in 2010. With the removal of the lead- and copper-contaminated soil in the DRMO Impact Area, potentially unacceptable risks from exposure to soil at the DRMO Impact Area were eliminated; therefore, further action is not required to protect human health and the environment in the DRMO Impact Area.

Remedial Action Objectives

Remedial action objectives (RAOs) are the goals that a cleanup plan should achieve. They are established to protect human health and the environment and comply with all pertinent federal and state regulations. The following RAOs were developed for OU2 based on its current and reasonably anticipated future use:

- Prevent human exposure through ingestion, dust inhalation, and dermal (skin) contact to contaminated soil with **chemical of concern (COC)** concentrations that exceed **cleanup levels** (concentrations causing potentially unacceptable risk).
- Protect the offshore environment from erosion of contaminated soil from the OU2 shoreline.

- Prevent unacceptable risk from future potential migration of contaminants from unsaturated zone soil to groundwater in the capped area.

Site-specific risk-based OU2 cleanup levels were developed in the FS for the soil COCs antimony, copper, lead, nickel, PAHs [evaluated collectively as **benzo(a)pyrene equivalents** (BaPEqs)], and total PCBs and are provided in Table 1. The cleanup levels are based on average concentrations in soil and are not based on maximum concentrations. A cleanup level is identified as NA for COCs that had acceptable levels for the identified person.

Table 1. Cleanup Levels

COC	Construction Worker (mg/kg)	Industrial User (mg/kg)	Recreational User (mg/kg)	Resident (mg/kg)
Antimony	516	681	3930	73
Copper	NA	NA	NA	7,300
Lead	2,000	1,600	4,600	400
Nickel	NA	NA	NA	3,650
PAHs (BaPEqs)	NA	2	5	0.7
PCBs (total)	NA	6	34	1

Summary of Remedial Alternatives

Remedial alternatives, or cleanup options, were identified in the OU2 FS to meet the RAOs identified above. These alternatives are different combinations of plans to restrict access and to contain, remove, or treat contamination to protect human health and the environment. Alternatives were developed for two areas within OU2, the waste disposal area and DRMO area, based on types and concentrations of contaminants. Types and concentrations of contamination at Site 6 appear to be similar to contamination in the western portion of Site 29; therefore, for the development of alternatives, Site 6 and a portion of Site 29 were evaluated together and referred to as the DRMO area, and the remainder of Site 29 was evaluated separately and was referred to as the waste disposal area. Cleanup alternatives were not developed for the DRMO Impact Area because further action is not required. The alternatives evaluated in the FS included:

Waste Disposal Area Alternatives

- WDA-1 – No Action
- WDA-2 – LUCs and Monitoring
- WDA-3 – Surface Soil Removal and Soil Cover with LUCs and Monitoring
- WDA-4 – Unsaturated Soil Removal and Soil Cover with LUCs and Monitoring

DRMO Area Alternatives

- DRMO-1 – No Action
- DRMO-2 – LUCs and Monitoring
- DRMO-3 – Residential Excavation with Off-Yard Disposal, LUCs, and Monitoring
- DRMO-4 – Construction Worker Excavation with Off-Yard Disposal, LUCs, and Monitoring
- DRMO-5 – Construction Worker Excavation and **RCRA C Cap** with Off-Yard Disposal, LUCs, and Monitoring

No Action Alternatives: WDA-1 and DRMO-1

"No action" alternatives, where no cleanup remedies would be applied at the site, were evaluated for each of the two cleanup areas at OU2, the waste disposal area and DRMO area. This is required under CERCLA, and it serves as a baseline for comparison with other alternatives. OU2 would be left as it is today under the no action alternatives.

Waste Disposal Area Alternatives

WDA-2: LUCs and Monitoring

Alternative WDA-2 would consist of implementing LUCs (LUCs may include institutional or administrative controls and/or engineering or physical controls) to prevent unacceptable human exposure to contaminated surface and subsurface soil across the entire waste disposal area and conducting groundwater and offshore sediment accumulation monitoring. Groundwater monitoring would be conducted to provide confidence that contamination in waste material is not migrating to groundwater at unacceptable levels, and offshore sediment accumulation monitoring would be conducted to provide confidence that contamination is not migrating via erosion to the offshore area.

WDA-3: Surface Soil Removal and Soil Cover with LUCs and Monitoring

Alternative WDA-3 would consist of excavation and off-yard disposal of soil and waste material from 0 to 2 feet below ground surface (bgs) within the proposed soil cover limits, and excavation and off-yard disposal of soil and debris from the small pockets of contaminated soil adjacent to the proposed soil cover limits. This process would allow for the construction of a 2-foot-thick soil cover without changing the ground surface elevations surrounding Building 310 or the associated parking and access features. This alternative would also include implementation of LUCs to identify Building 310 and the shoreline stabilization features as critical existing site features that must remain on site to ensure the integrity of the soil cover and to restrict unauthorized access to and digging within the proposed soil cover limits. In addition, groundwater monitoring and sediment accumulation monitoring would be conducted to provide confidence that contamination in waste material is not migrating to groundwater at unacceptable levels or eroding to the offshore area, respectively.

WDA-4: Unsaturated Soil Removal and Soil Cover with LUCs and Monitoring

Alternative WDA-4 would consist of excavation and off-yard disposal of soil and waste material located above the groundwater table within the limits of the waste disposal area, and excavation and off-yard disposal of soil and debris from the small pockets of contaminated soil adjacent to the proposed soil cover limits. Contaminated soil and waste located below the mean high tide groundwater table and beneath Building 310 would remain in place. After excavation is completed, the excavation area would be backfilled with soil to return the area to pre-construction grades, elevations, and surface types. It is estimated that an average of 6 feet of clean soil (including pavement for parking and access) would be placed on top of waste material remaining in the saturated zone. This alternative would also include LUCs to identify Building 310 and the shoreline stabilization features as critical existing site features that must remain on site to ensure the integrity of the soil cover and to restrict unauthorized access and digging within the proposed soil cover limits. In addition, groundwater monitoring and sediment accumulation monitoring would be conducted to provide confidence that contamination in waste material is not migrating to groundwater at unacceptable levels or eroding to the offshore area, respectively.

DRMO Alternatives

DRMO-2: LUCs and Monitoring

Alternative DRMO-2 would consist of implementing LUCs for the DRMO area where soil contamination is associated with potentially unacceptable risk based on residential exposure. The western boundary of contamination in the DRMO area would be identified during the Pre-Design Investigation. In addition, LUCs would be implemented to prevent potentially unacceptable human exposure to contaminated surface and subsurface soil across the DRMO area. Groundwater monitoring and sediment accumulation monitoring would be conducted to provide confidence that contamination in soil is not migrating to groundwater at unacceptable levels or eroding to the OU2 offshore area, respectively.

DRMO-3: Residential Excavation with Off-Yard Disposal, LUCs, and Monitoring

Alternative DRMO-3 would consist of excavation and off-yard disposal of contaminated soil within the limits of the DRMO area that is associated with potentially unacceptable risk based on residential exposure. Excavation would extend to the top of the rock fragment fill layer, which is an average of 6 feet within the DRMO area. After excavation is completed, the excavation area would be backfilled to establish preconstruction grades, elevations, and surface types using clean soil and pavement, where necessary. The western boundary of contamination in the DRMO area would be identified during the Pre-Design Investigation. Soil contamination beneath Building 298 would not be removed; therefore, this alternative would also include LUCs to restrict access to the soil within the footprint of Building 298. In addition, groundwater monitoring would be conducted to provide confidence that contamination in soil beneath Building 298 is not migrating to groundwater at unacceptable levels.

DRMO-4: Construction Worker Excavation with Off-Yard Disposal, LUCs, and Monitoring

Alternative DRMO-4 would consist of excavation and off-yard disposal of DRMO area soil associated with potentially unacceptable risk based on construction worker exposure. Excavation would extend to the top of the rock fragment fill layer, which is an average of 6 feet within the DRMO area. After excavation is completed, the excavation area would be backfilled to establish preconstruction grades, elevations, and surface types using clean soil and pavement, where necessary. The western boundary of contamination in the DRMO area would be identified during the Pre-Design Investigation. This alternative would also include LUCs to identify Building 298 and the shoreline stabilization features as critical existing features that must remain on site to ensure the integrity of the remedy, to restrict unauthorized digging within the footprint of Building 298. Because this alternative would not include excavation to residential exposure criteria, LUCs would also restrict residential use of the DRMO area. In addition, groundwater monitoring and sediment accumulation monitoring would be conducted to provide confidence that contamination in soil is not migrating to groundwater at unacceptable levels or eroding to the offshore area, respectively.

DRMO-5: Construction Worker Excavation and Capping with Off-Yard Disposal, LUCs, and Monitoring

Alternative DRMO-5 would consist of excavation and off-yard disposal of soil associated with potentially unacceptable risk based on construction worker exposure and constructing a permanent RCRA C cap system over the area where the existing interim cap is constructed. Excavation would extend to the top of the rock fragment fill layer, which is an average of 6 feet within the DRMO area. After excavation is completed, the excavation area would be backfilled to establish preconstruction grades, elevations, and surface types using clean soil and pavement, where necessary. The western boundary of contamination in the DRMO area would be identified during the Pre-Design Investigation. This alternative would also include implementing LUCs to identify Building 298 and the shoreline stabilization features as critical existing features that must remain on site to ensure the integrity of the remedy, to restrict unauthorized digging within the proposed cap limits and footprint of Building 298. Because this alternative would not include excavation to residential exposure criteria, LUCs would also restrict residential use of the DRMO area. In addition, groundwater monitoring and sediment accumulation monitoring would be conducted to

provide confidence that contamination in soil is not migrating to groundwater at unacceptable levels or eroding to offshore areas, respectively.

Evaluation of Alternatives

EPA has established nine criteria for use in comparing the advantages/disadvantages of cleanup alternatives. These criteria fall into three groups, threshold criteria, primary balancing criteria, and modifying criteria. These nine criteria are explained in the text box, ***What are the Nine Evaluation Criteria?*** A detailed analysis of alternatives can be found in the FS.

Preferred Alternatives

Based on information available at this time, the Navy recommends Alternatives WDA-3 and DRMO-4 to address contaminated soil at OU2 and to provide long-term risk reduction. The Navy believes that the Preferred Alternatives (WDA-3 and DRMO-4) meet the threshold criteria and provide the best balance of tradeoffs among the other alternatives with respect to the modifying criteria (see Tables 2 and 3). Further action is not required at the DRMO Impact Area because potential unacceptable risks were addressed by the 2010 removal action. The Navy proposes that this be the final remedy for OU2.

The Navy expects the Preferred Alternatives to satisfy the following statutory requirements of CERCLA Section 121(b): (1) be protective of human health and the environment; (2) comply with **applicable or relevant and appropriate requirements (ARARs)**; (3) be cost-effective; and (4) utilize permanent solutions to the maximum extent practicable.

The Navy may decide to change its Preferred Alternatives in response to public comment or new information. After the end of the public comment period on this Proposed Plan, the Navy, with the concurrence of EPA and after consultation with MEDEP, will document its selected remedy in a ROD.

The proposed waste disposal area alternative (Figures 2 and 3) would include the following steps:

- Excavation of soil and waste material from 0 to 2 feet bgs within the proposed soil cover limits and disposal of excavated soil in an off-yard landfill.
- Excavation and off-yard disposal of soil and waste material in areas adjacent to the proposed cover limits.
- Construction of a 2-foot-thick soil cover consisting of a geotextile, common fill, topsoil, and in some locations pavement.
- Implementing LUCs via a LUC Remedial Design (RD) to document the LUCs, specify operation and maintenance of the soil cover, restrict unauthorized digging within the proposed soil cover limits, identify inspection requirements, establish signage requirements, and document responsible parties. The LUCRD would document the requirements for authorized digging within the cover, such as cover replacement, management of excavated materials, and construction worker health and safety protocols if digging is needed. LUCs would be required as long as COC concentrations exceed levels that allow for unrestricted use/unlimited exposure.
- Conducting groundwater monitoring to provide confidence that contamination is not migrating to groundwater at unacceptable levels.
- Conducting sediment accumulation monitoring to provide confidence that contaminated soil is not eroding and migrating to the offshore area such that sediment accumulates in the intertidal area immediately east of Site 29.
- Conducting a review of the site every 5 years to ensure that the alternative remains protective.

Alternative WDA-3 is preferred over the other alternatives because it provides the Navy's preferred balance between long-term effectiveness for current and planned future industrial use of the site, implementability, and cost. Alternative WDA-3 would remove contamination in the top 2 feet of soil and provide a physical barrier (soil cover) to prevent potential industrial or recreational exposure to underlying contamination rather than relying only on institutional or administrative controls to prevent potential exposure, as provided under Alternative WDA-2. The Navy prefers Alternative WDA-3 over Alternative WDA-4, which would involve removal of additional contamination in the subsurface (to approximately 6 feet bgs), because Alternative WDA-4 would rely on the same soil cover and LUCs as Alternative WDA-3 to be protective of human health and the environment. Therefore, Alternative WDA-4 does not provide significant additional protection to warrant the higher costs and additional implementability concerns associated with excavation to a deeper depth and to address construction concerns associated with protection of the Building 310 foundation.

The proposed DRMO area alternative (Figure 4) would include the following steps:

- Excavation and off-yard disposal of soil associated with potentially unacceptable risks to construction workers. Soil above the rock fragment fill layer (an estimated average depth of 6 feet bgs) in the excavation areas on Figure 4 would also remove contamination that poses a potential unacceptable risk to current industrial site users and hypothetical recreational users.
- Restoring excavated areas to establish pre-construction grades, elevations, and surface types, using clean soil and pavement where necessary.
- Implementing LUCs via a LUCRD to document the LUCs,

specify operation and maintenance of site features, prevent exposure to soil beneath Building 298 for all receptors, prevent residential exposure to soil within the DRMO area, identify inspection requirements, establish signage requirements, and document responsible parties. LUCs would be required as long as COC concentrations exceed levels that allow for unrestricted use/unlimited exposure.

- Conducting groundwater monitoring to provide confidence that contamination is not migrating to groundwater at unacceptable levels.
- Conducting sediment accumulation monitoring to provide confidence that contaminated soil is not eroding and migrating to the offshore area such that sediment accumulates in the intertidal area immediately east of Site 29.
- Conducting a review of the site every 5 years to ensure that the alternative remains protective.

Alternative DRMO-4 is preferred over the other alternatives because it provides the Navy's preferred balance between long-term effectiveness for current and planned future industrial use of the site, implementability, and cost. Alternative DRMO-4 would remove contaminated soil to prevent current industrial site users and hypothetical recreational users from exposure to contaminated soil in the DRMO area and implement LUCs to prevent future exposure to contaminated soil under Building 298 and residential exposure to contaminated soil in the DRMO area.

Alternative DRMO-4 includes removal of contamination in the interim capped area so that there will no longer be a future potential for migration of contamination from this area to groundwater. This would provide more long-term effectiveness than Alternative DRMO-5, which includes a permanent cap in this area. Alternative DRMO-2 would not include any removal of contamination and relies on LUCs to be protective of current site users. The Navy prefers Alternative DRMO-4 over Alternative DRMO-3, which would include excavation of a larger area of soil to meet cleanup levels for hypothetical future residents. Alternative DRMO-3 was not selected because current and future planned use is not likely to be residential and therefore the higher costs and implementability and short-term effectiveness concerns associated with the large area excavation would not be warranted.

What are the Nine Evaluation Criteria?

The following is a summary of the nine CERCLA-mandated criteria used to evaluate the remedial alternatives. The first two criteria are considered threshold criteria, and any alternative selected must meet them. The next five criteria are the balancing criteria. The last two criteria, state (MEDEP) and community acceptance, will be addressed after the public comment period on this Proposed Plan.

1. ***Overall Protection of Human Health and the Environment*** determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.
2. ***Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)*** evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.
3. ***Long-Term Effectiveness and Permanence*** considers the ability of an alternative to maintain protection of human health and the environment.
4. ***Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment*** evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.
5. ***Short-Term Effectiveness*** considers the technical and administrative feasibility of implementing the alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
6. ***Implementability*** considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.
7. ***Cost*** includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over the time in terms of today's dollar value. The alternative should provide the necessary protection for a reasonable cost. Cost estimates are expected to be accurate within a range of +50 to -30 percent.
8. ***State/Support Agency Acceptance*** considers whether the State agrees with EPA's analyses and recommendations, as described in the FS and Proposed Plan.
9. ***Community Acceptance*** considers whether the local community agrees with the Navy and EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

TABLE 2: WASTE DISPOSAL AREA DESCRIPTION OF REMEDIAL ALTERNATIVES				
ALTERNATIVE	WDA-1	WDA-2	WDA-3	WDA-4
Estimated Time Frame (months)				
Designing and Constructing the Alternative	N/A	12	14	16
Achieving the Cleanup Objectives	N/A	12	14	16
Criteria Analysis				
Threshold Criteria				
Protects Human Health and the Environment ➢ Will it protect you and plant and animal life on and near the site?	○	◉	●	●
Meets federal and state regulations ➢ Does the alternative meet federal and state environmental statutes, regulations and requirements?	N/A	●	●	●
Primary Balancing Criteria				
Provides long-term effectiveness and is permanent ➢ Will the effects of the cleanup last?	○	◉	●	●
Reduces mobility, toxicity, and volume of contaminants through treatment ➢ Are the harmful effects of the contaminants, their ability to spread, and the amount of contaminated material present reduced?	○	○	○	○
Provides short-tem protection ➢ How soon will the site risks be reduced? ➢ Are there hazards to workers, residents, or the environment that could occur during cleanup?	N/A	●	◉	◉
Can it be implemented ➢ Is the alternative technically feasible? ➢ Are the goods and services necessary to implement the alternative readily available?	N/A	●	◉	○
Cost ($) ➢ Upfront costs to design and construct the alternative (capital costs) ➢ Operating and maintaining any system associated with the alternative (O&M costs) ➢ Periodic costs associated with the alternative (periodic costs) ➢ Total cost in today's dollars (30-year NPW cost)	$0	$27,000 capital 30-year NPW: $382,000	$1,211,000 capital 30-year NPW: $1,566,000	$2,619,000 capital 30-year NPW: $2,974,000
Modifying Criteria				
State Agency Acceptance ➢ Does MEDEP agree with the Navy's recommendation?	To be determined after the public comment period.			
Community Acceptance ➢ What objections, suggestions, or modifications does the public offer during the comment period?	To be determined after the public comment period.			
Relative comparison of the nine balancing criteria and each alternative: ● – Good , ◉ – Average, ○ – Poor; N/A – not applicable;				

TABLE 3: DRMO AREA DESCRIPTION OF REMEDIAL ALTERNATIVES					
ALTERNATIVE	DRMO -1	DRMO-2	DRMO-3	DRMO-4	DRMO-5
Estimated Time Frame (months)					
Designing and Constructing the Alternative	N/A	12	24	18	18
Achieving the Cleanup Objectives	N/A	12	24	18	18
Criteria Analysis					
Threshold Criteria					
Protects Human Health and the Environment ➢ Will it protect you and plant and animal life on and near the site?	○	◉	●	●	●
Meets federal and state regulations ➢ Does the alternative meet federal and state environmental statutes, regulations and requirements?	N/A	●	●	●	●
Primary Balancing Criteria					
Provides long-term effectiveness and is permanent ➢ Will the effects of the cleanup last?	○	◉	●	●	◉
Reduces mobility, toxicity, and volume of contaminants through treatment ➢ Are the harmful effects of the contaminants, their ability to spread, and the amount of contaminated material present reduced?	○	○	○	○	○
Provides short-tem protection ➢ How soon will the site risks be reduced? ➢ Are there hazards to workers, residents, or the environment that could occur during cleanup?	N/A	●	◉	◉	◉
Can it be implemented ➢ Is the alternative technically feasible? ➢ Are the goods and services necessary to implement the alternative readily available?	N/A	●	○	◉	◉
Cost ($) ➢ Upfront costs to design and construct the alternative (capital costs) ➢ Operating and maintaining any system associated with the alternative (O&M costs) ➢ Periodic costs associated with the alternative (periodic costs) ➢ Total cost in today's dollars (30-year NPW cost)	$0	$29,000 capital 30-year NPW: $874,000	$16,082,000 capital 30-year NPW: $16,829,000	$6,366,000 capital 30-year NPW: $7,195,000	$4,467,000 Capital 30-year NPW: $5,312,000
Modifying Criteria					
State Agency Acceptance ➢ Does MEDEP agree with the Navy's recommendation?	To be determined after the public comment period.				
Community Acceptance ➢ What objections, suggestions, or modifications does the public offer during the comment period?	To be determined after the public comment period.				
Relative comparison of the Nine Balancing Criteria and each alternative: ● – Good , ◉ – Average, ○ – Poor; N/A – not applicable;					

FIVE-YEAR REVIEW REQUIREMENTS

Because contamination will remain at Sites 6 and 29 in excess of levels that allow for unrestricted use and unlimited exposure, reviews of the protectiveness of the chosen alternative will be needed every 5 years. The five-year reviews will need to confirm that the remedy remains protective of human health and the environment. Five-year reviews will be needed as long as COC concentrations exceed levels that allow for unrestricted use/unlimited exposure.

COMMUNITY PARTICIPATION

The public is encouraged to participate in the decision-making process for the cleanup of OU2 by reviewing and commenting on this Proposed Plan during the public comment period, which is from July 21 to August 19, 2011.

What Do You Think?

You do not have to be a technical expert to comment. If you have a comment, the Navy wants to hear it before beginning the cleanup.

What is a Formal Comment?

Federal regulations make a distinction between "formal" comments received during the 30-day comment period and "informal" comments received outside this comment period. Although the Navy uses comments throughout the cleanup process to help make cleanup decisions, it is required to respond to formal comments.

Your formal comments will become part of the official record for OU2. This is a crucial element in the decision-making process for the site. The Navy will consider all significant comments received during the comment period prior to making the final cleanup decision for the site. Written comments will be included in the Responsiveness Summary contained in the ROD.

Formal comments can be made in writing or orally. To make a formal comment on the Proposed Plan, you may:

- Offer oral comments during the public hearing on August 10, 2011.
- Provide written comments at the informational open house, public hearing, or by fax or mail. Comments must be postmarked no later than August 19, 2011.

A tear-off mailer is provided as part of this document for your convenience.

NEXT STEPS

The Navy will consider and address all significant public comments received during the comment period. The responses to written comments will be included in the Responsiveness Summary in the ROD, which will document the final CERCLA remedy selected by the Navy and EPA, in consultation with MEDEP, for OU2. After the ROD is signed, it will be made available to the public at the Information Repositories located at the following locations:

Rice Public Library
8 Wentworth Street
Kittery, Maine 03904
Telephone: (207) 439-1553

Portsmouth Public Library
175 Parrott Avenue
Portsmouth, New Hampshire 03801
Telephone: (603) 427-1540

To Comment Formally:

Send Written Comments postmarked no later than August 19, 2011 to:

Ms. Danna Eddy
Public Affairs Office (Code 100PAO)
Portsmouth Naval Shipyard
Portsmouth, NH 03804-5000

Fax Comments by August 19, 2011, to the attention of:

Ms. Danna Eddy
Public Affairs Office (Code 100PAO)
Portsmouth Naval Shipyard
Fax: (207) 438-1266

For More Detailed Information, You May Go to the Public Information Repository

The Proposed Plan was prepared to help the public understand and comment on the preferred cleanup alternatives for this site and provides a summary of a number of reports and studies.

The technical and public information documents used by the Navy to prepare the Proposed Plan are available at the following Information Repositories:

Rice Public Library
8 Wentworth Street
Kittery, Maine 03904
Telephone: (207) 439-1553

Portsmouth Public Library
175 Parrott Avenue
Portsmouth, New Hampshire 03801
Telephone: (603) 427-1540

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DRAWN BY: J. ENGLISH	DATE: 06/02/11	TETRA TECH	CONTRACT NUMBER: 00924 / CTO NUMBER: 444
CHECKED BY: J. SPEAKMAN	DATE: 06/03/11	OU2 LAYOUT MAP PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE	APPROVED BY: — / DATE: —
REVISED BY: —	DATE: —		APPROVED BY: — / DATE: —
SCALE: AS NOTED			FIGURE NO.: FIGURE 1 / REV: 0

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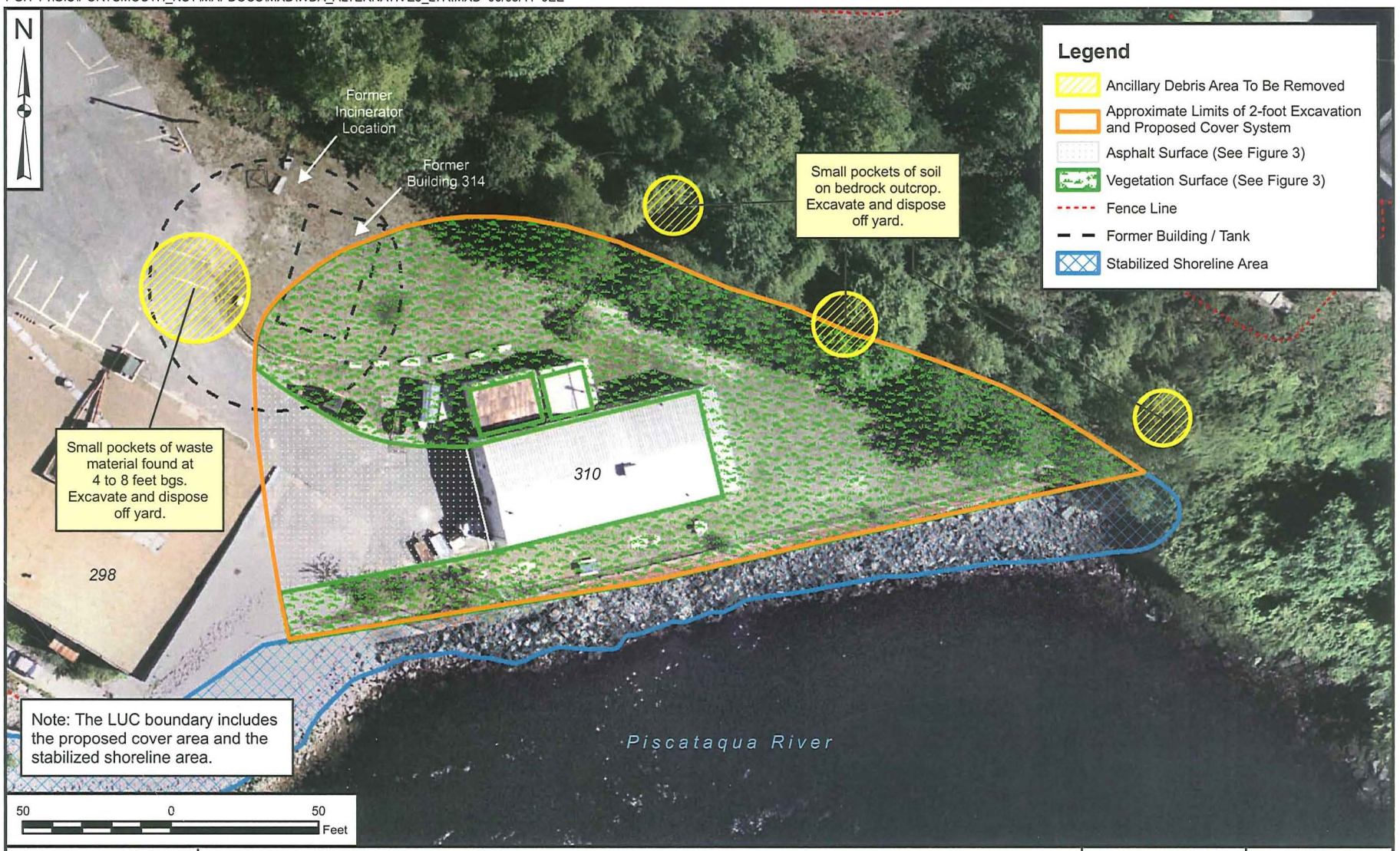

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REVISED BY —	DATE —		APPROVED BY — DATE —
SCALE AS NOTED			FIGURE NO. FIGURE 2 / REV 0

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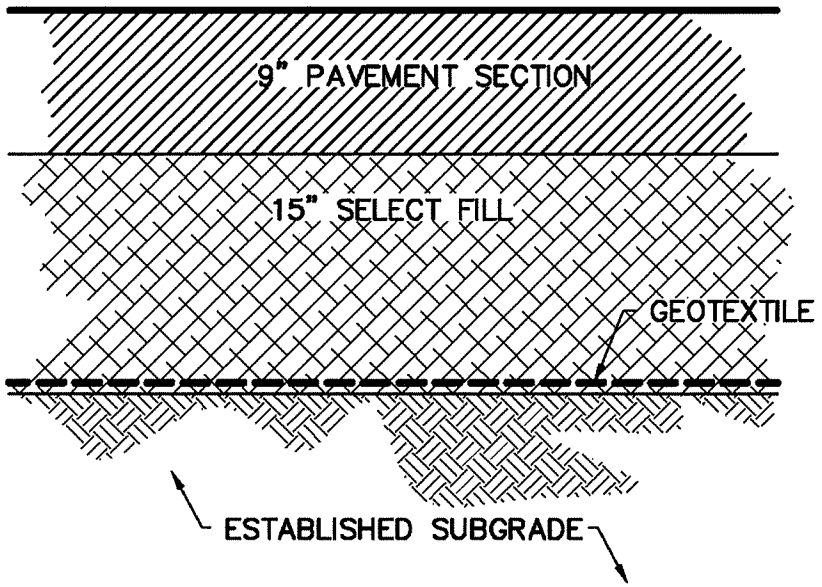

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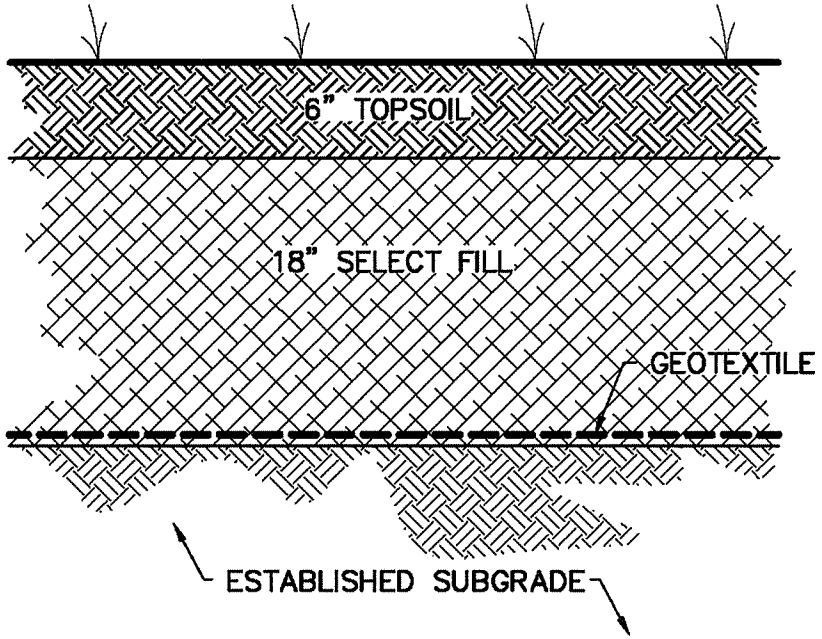

VEGETATIVE SECTION
NOT TO SCALE

DRAWN BY BH DATE 11/10/08	Tetra Tech NUS, Inc.	TYPICAL COVER SYSTEM DETAILS OPERABLE UNIT 2 PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE	CONTRACT NO. 0924
CHECKED BY DATE			OWNER NO. CTO 444
REVISED BY DATE			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 3 / REV. 0

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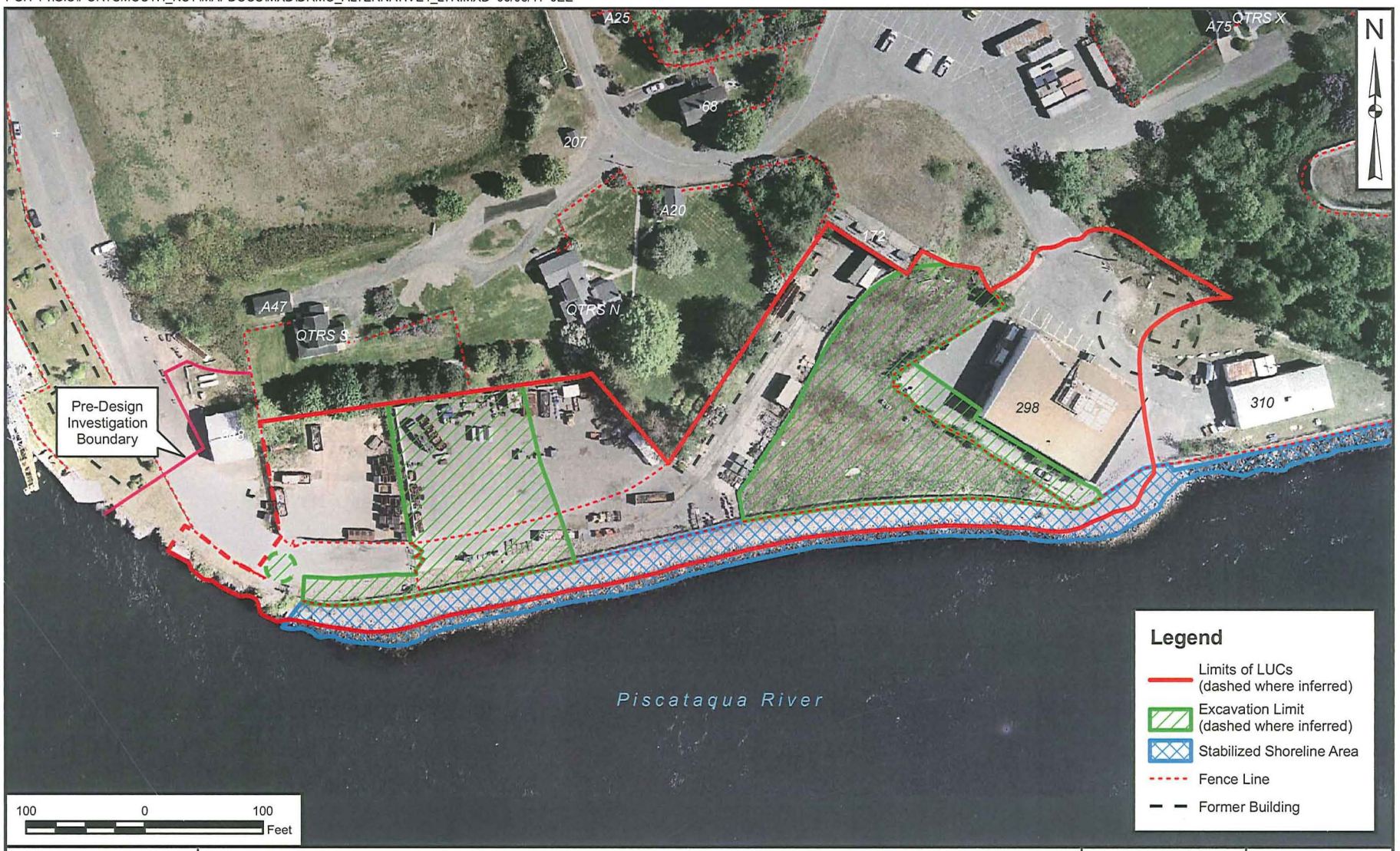

DRAWN BY: J. ENGLISH	DATE: 06/02/11	TETRA TECH	CONTRACT NUMBER: 00924 / CTO NUMBER: 444
CHECKED BY: J. SPEAKMAN	DATE: 06/03/11	DRMO AREA ALTERNATIVE DRMO-4 PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE	APPROVED BY: — / DATE: —
REVISED BY: —	DATE: —		APPROVED BY: — / DATE: —
SCALE: AS NOTED			FIGURE NO.: FIGURE 4 / REV: 0

GLOSSARY OF TERMS

This glossary defines the bolded terms used in this Proposed Plan. The definitions in this glossary apply specifically to this Proposed Plan and may have other meanings when used in different circumstances

Applicable or Relevant and Appropriate Requirements (ARARs): The federal, state, and local environmental rules, regulations, and criteria that must be met by the selected cleanup action under CERCLA.

Background: Concentrations of chemicals that would be found naturally in the environment (soil and groundwater) even if there had been no man-made sources or releases of chemicals.

Benzo(a)Pyrene Equivalent: The calculated concentration of carcinogenic (cancer-causing) PAHs relative to the toxicity associated with an equivalent concentration of benzo(a)pyrene.

Chemical of Potential Concern (COPC): Chemicals found at concentrations greater than federal and state risk-based screening levels.

Chemical of Concern (COC): COPCs that through further evaluation in human health and screening-level ecological risk assessments are determined to present an adverse effect on human and ecological health and the environment.

Cleanup Level: A numerical concentration agreed upon by the Navy and EPA, in consultation with MEDEP, as having to be reached for a certain COC to meet one or more of the RAOs. A cleanup level may be a regulatory-based criterion, a risk-based concentration, or even a background value.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): A federal law also known as "Superfund." This law was passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act. This law created a tax on the chemical and petroleum industries and provided broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment.

Dioxins/furans: Dioxins and furans are a family of toxic substances that share a similar chemical structure. Most dioxins and furans are created during the production of other chemicals or when products are burned. Dioxins and furans are highly persistent in the environment and can accumulate in the fatty tissues of animals.

Ecological Risk Assessment (ERA): A study that evaluates the potential risk to ecological receptors (various types of plants and animals) from contaminants at a site.

Feasibility Study (FS): A report that presents the description and analysis or evaluation of potential cleanup alternatives for a site. Focused FSs include only the remedial technologies that are most appropriate for the site conditions and would likely be conducted in a reasonable time period and are cost effective. Other remedial options were screened in the FS and could have been evaluated in more detailed but were not considered to be applicable for the site conditions.

Groundwater: Water found beneath the earth's surface that fills pores between such materials as sand, soil, gravel, or rock.

Hazard Index: The ratio of the daily intake of chemicals from onsite exposure divided by the reference dose for those chemicals. The reference dose represents the daily intake of a chemical that is not expected to cause adverse health effects.

Human Health Risk Assessment (HHRA): An evaluation of current and future potential for adverse human health effects from exposure to site contaminants.

Interim cap: A cap placed over a portion of the DRMO storage yard in 1993 as an interim measure prior to selection of a final cleanup action to protect human health and the environment and prevent contamination in soil and waste material from migrating into groundwater or eroding to the offshore area.

Land Use Controls (LUCs): Engineered and non-engineered measures formulated and enforced to regulate current and future land use options. Engineered measures include fencing and posting. Non-engineered measures typically consist of administrative deed restrictions that prohibit residential land use and/or groundwater use.

Leaching: Removal of soluble constituents from soil by the action of a percolating liquid such as stormwater during a rainfall event.

Metals: Metals are naturally occurring elements. Some metals, such as arsenic and mercury, can have toxic effects. Other metals, such as iron, are essential to the metabolism

of humans. Metals are classified as inorganic because they are of a mineral, not biological origin.

Monitoring: Collection of environmental information that helps track changes in the magnitude and extent of contamination at a site or in the environment.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP): More commonly called the National Contingency Plan, it is the federal government's blueprint for responding to both oil spills and hazardous substance releases. Following the passage of Superfund (CERCLA) legislation in 1980, the NCP was broadened to cover releases at hazardous waste sites requiring emergency removal actions. A key provision involves authorizing the lead agency to initiate appropriate removal action in the event of a hazardous substance release.

Net Present Worth (NPW): A costing technique that expresses the total of initial capital expenditure and long-term operation and maintenance costs in terms of present day dollars.

Polychlorinated biphenyls (PCBs): Polychlorinated biphenyls are a class of organic compounds with 1 to 10 chlorine atoms attached to a biphenyl, which is a molecule composed of two benzene rings. PCBs were widely used for many applications, especially as dielectric fluids in transformers, capacitors, and coolants. Due to PCB's toxicity and classification as a persistent organic pollutant, PCB production was banned by the United States Congress in 1979.

Polycyclic aromatic hydrocarbons (PAHs): High molecular weight, relatively immobile, and moderately toxic solid organic chemicals that feature multiple benzenic (aromatic) rings in their chemical formula. PAHs are normally formed during the incomplete combustion of coal, oil, gas, garbage, or other organic substances. Typical PAHs include anthracene, phenanthrene, and benzo(a)pyrene.

RCRA C Cap: The RCRA C Cap is a baseline design that is recommended for use in RCRA hazardous waste applications. These caps generally consist of an upper vegetative layer, a drainage layer, and a low permeability layer.

Receptor: An individual, either a human, plant, or animal that may be exposed to chemicals present at the site.

Record of Decision (ROD): An official document that describes the selected cleanup action for a specific site. The ROD documents the cleanup selection process and is issued by the Navy following the public comment period.

Remedial Action Objective (RAO): A cleanup objective agreed upon by the Navy and EPA, in consultation with MEDEP. One or more RAOs are typically formulated for each environmental site.

Remedial Investigation (RI): An in-depth study designed to gather data needed to determine the nature and extent of contamination at a Superfund site, establish site cleanup criteria, identify preliminary alternatives for remedial action, and support technical and cost analyses of alternatives.

Resource Conservation and Recovery Act (RCRA): The act that is the basis for all regulations for management of wastes from their point of origin until their safe treatment and disposal. The determination of what is considered to be a solid waste and whether or not the waste must be regulated as non-hazardous or hazardous is made following the procedures under RCRA.

Soil Washing Treatability Study: A study conducted to determine if soil washing is an effective treatment technology for contaminated soil at a site. Soil washing uses water and sometimes detergents to separate smaller, more-contaminated soil particles from larger, cleaner particles.

Unsaturated zone: The area above the groundwater level where soil pore spaces are not fully saturated, although some water may be present.

Use This Space to Write Your Comments

Your input on the Proposed Plan for contamination at OU2 Portsmouth Naval Shipyard is important to the Navy, EPA, and MEDEP. Comments provided by the public are valuable in helping to select the remedy for this site.

You may use the space below to write your comments, then fold and mail. Comments must be postmarked by August 19, 2011. Comments can be submitted via mail or fax and should be sent to the following address:

Ms. Danna Eddy
Public Affairs Office (Code 100PAO)
Portsmouth Naval Shipyard
Portsmouth, NH 03804-5000

Fax: (207) 438-1266

Name:
Address:
City:
State: Zip Code:
Telephone

FOLD HERE

PLACE
STAMP
HERE

Ms. Danna Eddy

Public Affairs Office (Code 100PAO)

Portsmouth Naval Shipyard

Portsmouth, NH 03804-5000