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RECORD OF DECISION OPERABLE UNIT (OU) 2 SITE 6, 29, AND DRMO IMPACT AREA

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RECORD OF DECISION

OPERABLE UNIT 2 - SITE 6, SITE 29, AND DRMO IMPACT AREA

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

NAVFAC
Naval Facilities Engineering Command

CONTRACT NUMBER N62470-08-D-1001

CONTRACT TASK ORDER WE43

September 2011

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Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
BaPEq	benzo(a)pyrene equivalents
bgs	below ground surface
CDI	chronic daily intake
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	chemical of concern
COPC	chemical of potential concern
CSF	cancer slope factor
CTE	central tendency exposure
cy	cubic yard
DoD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
EE/CA	Engineering Evaluation/Cost Analysis
EPC	exposure point concentration
ER,N	Environmental Restoration, Navy
FCS	Final Confirmation Study
FFA	Federal Facility Agreement
FS	Feasibility Study
HHRA	human health risk assessment
HI	hazard index
HQ	hazard quotient
IEUBK	Integrated Exposure Uptake Biokinetic
IR	Installation Restoration
LUC	land use control
MEDEP	Maine Department of Environmental Protection
mg/kg	milligram per kilogram
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPW	net present worth
O&M	operation and maintenance
OSWER	Office of Solid Waste and Emergency Response
OU	Operable Unit
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PNS	Portsmouth Naval Shipyard

PPE	personal protective equipment
RAB	Restoration Advisory Board
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RfD	reference dose
RFI	RCRA Facility Investigation
RI	Remedial Investigation
RME	reasonable maximum exposure
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SF	slope factor
SVOC	semi-volatile organic compound
TRW	Technical Review Workgroup
UCL	upper confidence limit
µg/dL	microgram per deciliter
USC	United States Code
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound

1.0 DECLARATION

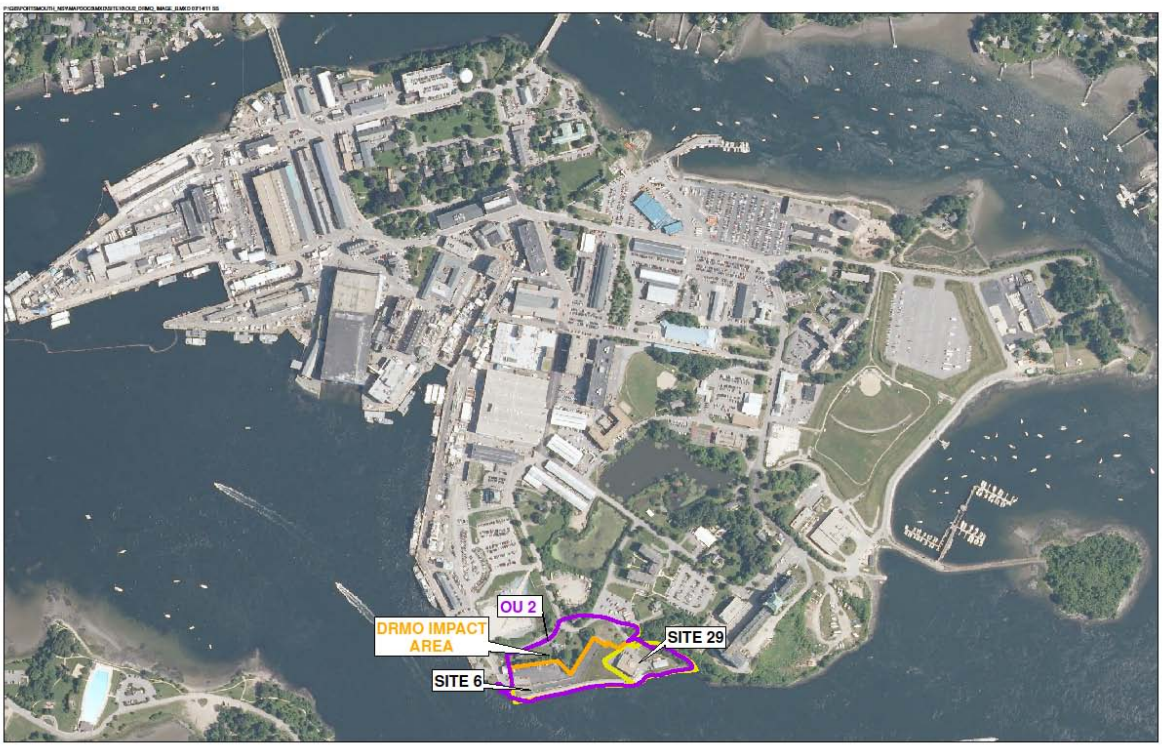
1.1 SITE NAME AND LOCATION

Portsmouth Naval Shipyard (PNS)
United States Environmental Protection Agency (USEPA) ID No. ME7170022019
Operable Unit (OU) 2 – Site 6, Site 29, and Defense Reutilization and Marketing Office (DRMO) Impact Area
Kittery, Maine

1.2 STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) presents the Selected Remedies for contamination at Sites 6 and 29 and documents the selection of No Further Action as the Selected Remedy for the DRMO Impact Area. These remedies were chosen by the Navy and USEPA in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 United States Code (USC) §9601 et seq., as amended by the Superfund Amendments and Reauthorization Act (SARA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 Code of Federal Regulations (CFR) Part 300 et seq., as amended. This decision is based on information contained in the Administrative Record for the site. The Maine Department of Environmental Protection (MEDEP) concurs with the Selected Remedies (see Appendix A). The OU2 area of PNS is shown on Figure 1-1.

FIGURE 1-1. SITE LOCATION MAP



1.3 ASSESSMENT OF SITE

The response action alternatives selected in this ROD are necessary to protect human health and the environment from actual or threatened releases of pollutants or contaminants from Sites 6 and 29 that may present an imminent and substantial endangerment to public health or welfare. A CERCLA action is required because concentrations of antimony, copper, lead, nickel, polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs) in soil pose potential unacceptable current and future risk to industrial workers (construction and occupational), recreational users, and hypothetical residential users. Copper, lead, and nickel in unsaturated soil in a portion of Site 6 (with an impermeable cap) pose a potential future unacceptable risk to the environment if these chemicals migrate to groundwater that mixes with offshore surface water at levels that could cause adverse impact on biota in the surface water. Copper, lead, and nickel in soil at Sites 6 and 29 pose a potential future unacceptable risk to the environment if the soil erodes and accumulates in sediment in the offshore area.

Contaminated soil within the DRMO Impact Area (adjacent to the DRMO Storage Yard) was removed in 2010, thereby eliminating potentially unacceptable risks from exposure to contamination in this portion of OU2. Therefore, further action is not required to protect human health and the environment in the DRMO Impact Area.

1.4 DESCRIPTION OF SELECTED REMEDIES

The types and concentrations of contaminants at Site 6 and in the western portion of Site 29 are similar; therefore, the areas were combined and referred to as the DRMO area for development of cleanup alternatives. The remainder of Site 29 was evaluated as the waste disposal area.

The major components of the Selected Remedy for the waste disposal area include the following:

- Excavation of soil and waste material from 0 to 2 feet below ground surface (bgs) within the waste disposal area and disposal of excavated soil in an off-yard landfill.
- Excavation and off-yard disposal of soil and waste material in debris areas adjacent to the waste disposal area.
- Construction of a 2-foot-thick soil cover over the area where waste material remains below 2 feet bgs. The cover will consist of a geotextile, common fill, topsoil, and in some locations pavement. Excavation of soil from 0 to 2 feet bgs within the waste disposal area before placement of the cover will reduce the impact to final site elevations; thereby reducing the impact to site operations.
- Implementation of land use controls (LUCs) via a LUC Remedial Design (RD) to require continued presence of site features to prevent erosion, require maintenance of the soil cover, restrict unauthorized digging within the proposed soil cover limits, identify inspection requirements, establish signage requirements, restrict residential land use, and document responsible parties.
- Groundwater monitoring to provide confidence that copper, lead, and nickel in waste material does not migrate to groundwater at unacceptable levels.
- Sediment accumulation monitoring to provide confidence that contaminated material does not erode and migrate to the offshore area and accumulate in the intertidal area immediately east of Site 29.
- Five-year site reviews to ensure that the remedy remains protective of human health and the environment.

The Selected Remedy for the waste disposal area removes contamination in the top 2 feet of soil and provides a physical barrier to prevent potential industrial or recreational exposure to underlying contamination. LUCs will prevent residential site use. The Selected Remedy for the waste disposal area is expected to achieve substantial long-term risk reduction and allow the property to be used for the current and reasonably anticipated future land use, which is industrial.

The major components of the Selected Remedy for the DRMO area include the following:

- Excavation and off-yard disposal of soil associated with potentially unacceptable risks to construction workers. Excavation based on construction worker exposure will also address potential unacceptable risks for occupational and hypothetical recreational exposure. Excavation of contaminated soil will extend to a depth where there is very little soil and mostly rock (i.e., the rock fragment fill layer) or where contaminant concentrations are at acceptable levels for industrial land use.
- Restoring excavated areas to establish pre-construction grades, elevations, and surface types using clean soil and pavement, where necessary.
- Implementing LUCs via a LUC RD to require continued presence of site features to minimize erosion, prevent exposure to soil beneath Building 298 for all receptors, restrict residential land use, identify inspection requirements, establish signage requirements, and document responsible parties.
- Groundwater monitoring to provide confidence that copper, lead, and nickel contamination does not migrate to groundwater at unacceptable levels.
- Sediment accumulation monitoring to provide confidence that contaminated soil does not erode and migrate to the offshore area and accumulate in a potential sediment accumulation area offshore of OU2 (an intertidal area immediately east of Site 29 where there is potential ecological exposure to sediment).
- Five-year reviews to ensure that the remedy remains protective of human health and the environment.

The Selected Remedy for the DRMO area removes contaminated soil associated with potentially unacceptable industrial and recreational risks in the DRMO area and implements LUCs to prevent all future exposure to contaminated soil beneath Building 298 and to prevent residential exposure to contaminated soil in the remainder of the DRMO area. The Selected Remedy for the DRMO area is expected to achieve substantial long-term risk reduction and allow the property to be used for current and reasonably anticipated future land use, which is industrial.

Potentially unacceptable risks from exposure to contaminants were eliminated in the DRMO Impact Area in 2010; therefore, No Further Action is the Selected Remedy for the DRMO Impact Area.

This ROD documents the final remedial decisions for Sites 6 and 29 and DRMO Impact Area and does not include or affect any other sites at the facility. Implementation of this decision is consistent with current uses and the overall cleanup strategy for PNS to clean up sites to support base operations.

1.5 STATUTORY DETERMINATIONS

The Selected Remedies are protective of human health and the environment, comply with federal and state requirements that are applicable or relevant and appropriate to the remedial actions, are cost-effective, and utilize permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable. The Selected Remedies do not satisfy the statutory preference for remedies that use treatment as a principal element to reduce the toxicity, mobility, or volume of hazardous substances, pollutants, and contaminants. Based on the types, depths, and pattern of contamination across Sites 6 and 29, the Navy concluded that it was impracticable to treat the chemicals of concern (COCs) in a cost-effective manner.

Five-year site reviews will be required for Sites 6 and 29 because contamination will remain in excess of levels that allow for unrestricted use and unlimited exposure and will be conducted to confirm that the remedies remains protective of human health and the environment. Further action, including five-year reviews, is not required for the DRMO Impact Area because contamination has been removed to allow for unrestricted use and unlimited exposure.

1.6 ROD DATA CERTIFICATION CHECKLIST

The locations in Section 2.0, Decision Summary, of the information required to be included in the ROD are summarized in Table 1-1. Additional information can be found in the Administrative Record file for PNS.

TABLE 1-1. ROD DATA CERTIFICATION CHECKLIST

DATA	LOCATION IN ROD
COCs and their respective concentrations	Sections 2.5 and 2.7
Baseline risk represented by the COCs	Section 2.7
Cleanup levels established for COCs and the basis for these levels	Section 2.8
How source materials constituting principal threats are addressed	Section 2.11
Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the risk assessment	Section 2.6
Potential land and groundwater uses that will be available at the site as a result of the Selected Remedies	Section 2.12.3
Estimated capital, operating and maintenance, and total net present worth (NPW) costs; discount rate; and number of years over which the remedy costs are projected	Appendix F
Key factors that led to the selection of the remedies	Section 2.12.1

If previously unknown contamination posing an unacceptable risk to human health or the environment is discovered after execution of this ROD and is shown to be a result of Navy activities, the Navy will undertake the necessary actions to ensure continued protection of human health and the environment.

1.7 AUTHORIZING SIGNATURES

The signatures provided on the following pages validate the selection by the Navy and USEPA of the final remedies for contamination at Sites 6 and 29 and No Further Action for the DRMO Impact Area. MEDEP concurs with the Selected Remedies.

L. Bryant Fuller III
Captain, United States Navy
Commanding Officer
Portsmouth Naval Shipyard

9/27/11
Date

James T. Owens, III, Director
Office of Site Remediation and Restoration
USEPA Region 1

9/29/11
Date

2.0 DECISION SUMMARY

2.1 SITE NAME, LOCATION, AND BRIEF DESCRIPTION

PNS, USEPA ID number ME7170022019, is located on an island in the Piscataqua River, referred to on National Oceanic and Atmospheric Administration nautical charts as Seavey Island, with the eastern tip given the name Jamaica Island. PNS is located at the mouth to the Great Bay Estuary (commonly referred to as Portsmouth Harbor). The shipbuilding history of PNS dates back to the 1800s, and the facility has been engaged in the construction, conversion, overhaul, and repair of submarines for the Navy since 1917.

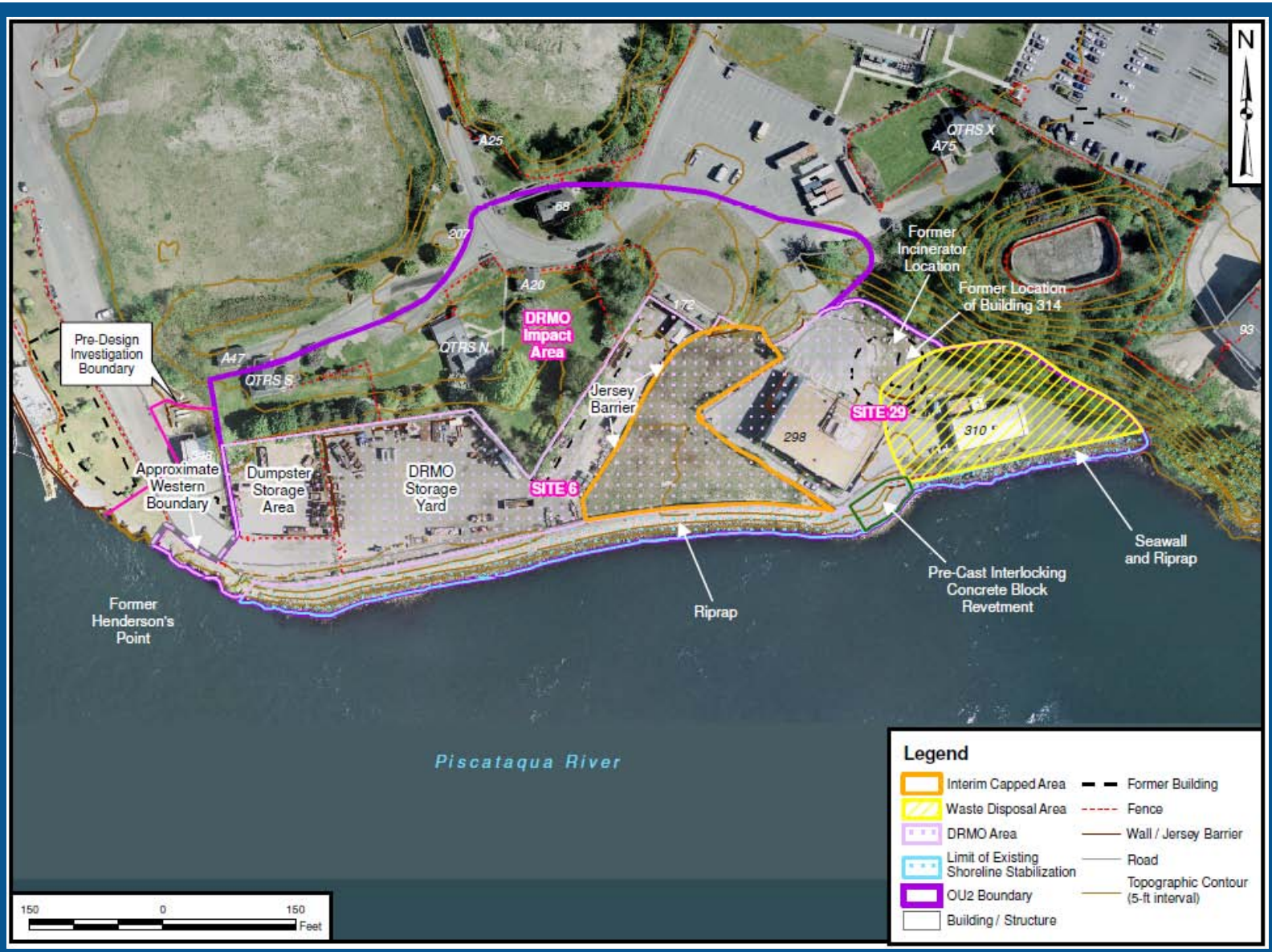
OU2 is located in the south-central portion of PNS along the Piscataqua River and consists of Site 6, Site 29, and the DRMO Impact Area. The majority of Sites 6 and 29 have been used for industrial activities since the 1920s, and the portion of the DRMO Impact Area where Quarters S, N, and 68 are located has been used as residences since the 1800s. The remainder of the DRMO Impact Area includes roads and parking area. Figure 1-1 shows the location of OU2 at PNS, and Figure 2-1 shows the layout of OU2.

Site 6, DRMO Storage Yard, was used from 1920 to 2010 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. Activities such as open storage of batteries and other materials that could have caused contaminants to be released were discontinued in 1983. Scrap metal storage was conducted in Building 146 until 2000, and the building was demolished in 2003. In 2010, DRMO Storage Yard activities were moved to another location, and a portion of the area is used currently for Shipyard contractor's trailer parking. The remaining portion of the former DRMO Storage Yard is not in use; however, the Shipyard plans to use the property for industrial activities.

The main activities that occurred at Site 29, 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 1918 until 1965, when the incinerator was built. The incinerator was used to burn trash, mainly wood, paper, household waste, and occasionally cans of paint and solvents until 1975. There are two buildings located in the Site 29 area; Building 298 is used for office space, and Building 310 is a hose-handling facility. The Shipyard has no plans to change the land use for this area.

PNS is an active facility, and environmental investigations and remediation at the facility are funded under the Environmental Restoration, Navy (ER, N) Program. The Navy is the lead agency for CERCLA activities at the facility, and USEPA and MEDEP are support agencies.

FIGURE 2-1. SITE FEATURES



2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

Table 2-1 provides brief summaries of previous investigations at OU2. Results of these investigations indicated antimony, copper, lead, nickel, PAHs, and PCBs are present in Sites 6 and 29 surface and subsurface soil at concentrations that exceed cleanup levels.

TABLE 2-1. PREVIOUS INVESTIGATIONS AND SITE DOCUMENTATION

INVESTIGATION	DATE	ACTIVITIES
Final Confirmation Study (FCS)	1984	Environmental samples were collected at Site 6 to verify the presence of contamination and potential migration of contamination from open battery storage activities. Further investigation and corrective measures under RCRA were recommended for Site 6.
Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI)	1989-1992	Surface and subsurface soil samples within and around the DRMO Storage Yard (including the area later identified as Site 29) were collected and analyzed to support evaluation of the nature and extent of contamination and site risks as part of the RFI. Approximately 40 samples were collected from 9 surface soil locations and 15 soil borings. Approximately 50 surface soil samples were collected from 27 locations in the DRMO Impact Area as part of the RFI to assess the potential for wind dispersal of contaminants from DRMO Storage Yard activities. Analyses included volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, PCBs, inorganics, and cyanide. Fourteen monitoring wells were installed in overburden and bedrock at OU2 during the RFI (10 at Site 6 and four at Site 29). The RFI showed contamination in the DRMO Storage Yard; but no apparent impact in the DRMO Impact Area from wind dispersal. Data gaps were identified during the RFI that required subsequent investigation.
Onshore Ecological Risk Assessment	1992	Conducted for three areas at PNS including the DRMO Storage Yard to determine risks to onshore ecological receptors. Tissue and vegetation sampling and vegetation, small mammal population, and bird population surveys were conducted to support the risk assessment. The risk assessment concluded that there were no onshore ecological concerns for OU2 because there is little habitat for ecological receptors. No further evaluation of OU2 onshore ecological risks was conducted.
Interim Corrective Measures at the DRMO Storage Yard	1993	Conducted to cover two areas of exposed contaminated soil in the DRMO Storage Yard to minimize migration of soil contaminants via surface runoff. An impermeable interim cap was installed over the area with the highest levels of lead and other contamination, and pavement was placed in the other area. Storm water controls and concrete curbs were also constructed to address stormwater runoff.
RFI Data Gap Investigation	1994	Conducted to resolve data gaps to address deficiencies in the RFI. The scope of the RFI Data Gap work that related to OU2 was a facility-wide hydrogeology investigation. At OU2, a deep bedrock well was installed (DW-7DB) at an existing monitoring well cluster (DW-7, DW-7B) and the three wells were sampled for analysis of VOCs, SVOCs, and inorganics. In addition to the groundwater investigation conducted at OU2, facility-wide maps were prepared for topography, bedrock surface, groundwater elevations at low and high tide, tidal influence, and salinity. The information was used as part of the evaluation of contaminant migration through groundwater.

TABLE 2-1. PREVIOUS INVESTIGATIONS AND SITE DOCUMENTATION

INVESTIGATION	DATE	ACTIVITIES
Groundwater Monitoring	1996-1997	Facility-wide groundwater monitoring program conducted to resolve data gaps to address deficiencies in the RFI. The purpose of the program was to present a snapshot of overall groundwater quality at PNS based on four rounds of quarterly groundwater data from monitoring wells at PNS. Except for one monitoring well at OU2 (DW-2), all of the OU2 monitoring wells were included in the monitoring program. DW-2 was found to be damaged and was not sampled. Groundwater samples were analyzed for SVOCs, pesticides, PCBs, and inorganics. The 1996 and 1997 groundwater monitoring data were used as part of the contaminant fate and transport modeling and the human health risk assessment for OU2. The data were also used to understand the hydrogeology at OU2.
Contaminant Fate and Transport Modeling	1996-1999	Conducted to evaluate migration of onshore contaminants to the offshore environment. Two phases of modeling were conducted, with the second phase conducted to refine the input parameters used in the first phase of modeling. The model results for OU2 were used to support initial understanding of contaminant fate and transport for OU2.
Field Investigation at Site 29	1998	Conducted to define the nature and extent of contamination and support risk assessment for Site 29. Seven soil borings at Site 29 and an upgradient soil and groundwater sampling location were included in the investigation. Sample analyses included VOCs, SVOCs, pesticides, PCBs, dioxins/furans, inorganics, and cyanide.
Emergency Removal Action (Shoreline Stabilization) at Site 6	1999	Conducted to stabilize the shoreline along Site 6 where soil erosion was observed. Existing concrete blocks and other materials were removed, the embankment regraded with existing rock, and a shoreline stabilization structure (including geotextile and riprap) installed over the existing soil along the shoreline.
Revised OU2 Risk Assessment	2000	Calculated and evaluated human health risks for different land use scenarios for Site 6, Site 29, and the DRMO Impact Area using updated risk assessment guidance and data collected since the initial risk assessment using only RFI data.
Building 298 Trenching	2002	Soil sampling conducted on the western and northern sides of Building 298 to support Shipyard utility trenching activities for the building. Eleven samples were collected from five soil borings, and analyzed for PAHs, inorganics, and dioxins/furans. The data were used to support the nature and extent of contamination evaluation in the Remedial Investigation (RI).
Soil Washing Treatability Study for OU2	2004-2005	Large-volume soil samples were collected from five test pits in areas with highly elevated contaminant concentrations, and a soil washing treatability study was conducted on the soil samples to support evaluation of a potential treatment option as part of an FS for OU2. Three test pits were in the interim capped area, one test pit in the waste disposal area, and one text pit along the shoreline in the western portion of the DRMO Storage Yard. The results indicated that contamination associated with fine-grained materials could be separated from the large-grained materials.
Emergency Removal Action (Shoreline Stabilization) at Site 29	2005, 2006, and 2008	Conducted to stabilize the shoreline between the DRMO Storage Yard and the area west of the seawall and east of the seawall at Site 29 where shoreline controls were not present. West of the seawall, debris on the shoreline slope was removed, the embankment regraded, and a shoreline stabilization structure similar to the 1999 structure was placed. Signs of potential failure of the shoreline controls placed in 2005 (sloughing of riprap and exposure of underlying filter fabric) were observed in 2007. In 2008, interlocking precast concrete slabs (A-Jacks) were placed at the bottom of the slope to provide additional slope stability. East of the seawall, surficial debris was removed in the wooded area and the area was covered with gravel. The area prone to erosion was stabilized with geotextile and rock.

TABLE 2-1. PREVIOUS INVESTIGATIONS AND SITE DOCUMENTATION

INVESTIGATION	DATE	ACTIVITIES
OU2 Additional Investigation	2007-2008	Conducted to refine the nature and extent of contamination for delineation of remediation areas at Sites 6 and 29 and in the portion of the DRMO Impact Area immediately adjacent to Site 6 and further evaluate contaminant migration in groundwater to the off shore. Soil, groundwater, and surface water samples were collected in 2007. The investigation of soil focused on the COCs identified in the 2000 risk assessment, and included lead, copper, nickel, PAH, and PCB analyses. Antimony analysis was not included because the contamination was collocated with lead and additional antimony data were not needed. Grid-based soil samples were collected from borings on 50-foot centers across Site 6 (excluding the capped area) and Site 29. Additional borings on approximate 25-foot centers were also installed. Surface and subsurface soil samples were collected from approximately 180 borings in the Sites 6 and 29 areas, and surface soil samples were collected from 20 hand auger locations in the portion of the DRMO Impact Area adjacent to Site 6. Field and laboratory-based analyses were conducted. The groundwater and surface water investigation focused on the COCs for potential offshore impact, which are copper, lead, and nickel. Six new monitoring wells were installed, and the new and existing overburden wells were sampled. Three rounds of sampling were conducted at the 14 wells. Twelve surface water samples were also collected from the OU2 offshore area to support the groundwater evaluation. The sampling in 2008 was conducted to delineate the extent of lead- and copper-contaminated soil that was found in the backyard of Quarters S and N (within the DRMO Impact Area) in 2007. Surface soil samples from approximately 100 hand auger locations were collected and analyzed for lead and copper.
DRMO Impact Area Engineering Evaluation/Cost Analysis (EE/CA)	2009	Prepared to compare non-time critical removal action alternatives to address risks resulting from lead- and copper-contaminated soil at Quarters S and N within the DRMO Impact Area. The Navy recommended soil excavation to eliminate potential unacceptable human health and environmental risks.
Supplemental RI Report	2010	Summarized the results of previous investigations and risk assessments for OU2 and updated the site characterization, nature and extent of contamination, and site risks for contaminant migration to the off shore based on the OU2 Additional Investigation conducted in 2007 and 2008 and shoreline removal action activities conducted since 2005. The conclusion of the Supplemental RI Report was that the nature and extent of contamination and site risks for exposure to soil and groundwater at OU2 were sufficiently defined to support the FS. Lead and other COC concentrations in soil at Sites 6 and 29 indicate potential unacceptable risks if the soil is exposed or excavated. Lead and copper concentrations in soil in the backyard of Quarters S and N indicate potential unacceptable risks. Exposure to groundwater does not pose unacceptable risks for human receptors. Lead, copper, and nickel contamination in soil at Site 6 may pose an unacceptable future risk to the off shore if the contaminants migrate to groundwater or erode to the off shore area.
Non-Time Critical Removal Action for DRMO Impact Area	2010	Conducted to remove lead- and copper-contaminated soil from the DRMO Impact Area portion of OU2 to allow for unrestricted and unlimited use of the area. Post-excavation confirmation sampling confirmed that soil associated with unacceptable risks had been removed.
Feasibility Study (FS)	2011	Conducted to develop and evaluate potential cleanup alternatives for Sites 6 and 29.
Proposed Plan	2011	Presented the Navy's Preferred Alternative to address contamination at Sites 6 and 29 and No Further Action for the DRMO Impact Area.

On May 31, 1994, PNS was placed on the National Priorities List by the USEPA pursuant to CERCLA of 1980 and SARA of 1986. The National Priorities List is a list of uncontrolled or abandoned hazardous waste sites identified by USEPA as requiring priority remedial actions. The Navy and USEPA signed the Federal Facility Agreement (FFA) for PNS in 1999 (USEPA, 1999) to ensure that environmental impacts associated with past and present activities at PNS are thoroughly investigated and that the appropriate remedial action is pursued to protect human health and the environment. In addition, the FFA establishes a procedural framework and timetable for developing, implementing, and monitoring appropriate responses at PNS, in accordance with CERCLA (and SARA of 1986, Public Law 99-499), 42 USC §9620(e)(1); the NCP, 40 CFR 300; RCRA, 42 USC §6901 et seq., as amended by the Hazardous and Solid Waste Amendment of 1984, Executive Order 12580; and applicable state laws. There have been no cited violations under federal or state environmental law or any past or pending enforcement actions pertaining to the cleanup of OU2.

2.3 COMMUNITY PARTICIPATION

The Navy has been conducting community relations activities for the Installation Restoration (IR) Program at PNS since the program began. From 1988 to November 1994, Technical Review Committee meetings were held on a regular basis. In 1994, a Restoration Advisory Board (RAB) was established to increase public participation in the IR Program process. Many community relations activities for PNS involve the RAB, which historically met quarterly and recently has met two to four times per year. The RAB provides a forum for discussion and exchange of information on environmental restoration activities between the Navy, regulatory agencies, and the community, and it provides an opportunity for individual community members to review the progress and participate in the decision-making process for various IR Program sites including OU2.

The following community relations activities are conducted at PNS as part of the Community Relations Program:

Information Repositories: The Public Library in Portsmouth, New Hampshire, and the Rice Public Library in Kittery, Maine, are the designated Information Repositories for the PNS IR Program.

Key Contact Persons: The Navy has designated information contacts related to PNS. Materials distributed to the public, including any fact sheets and press releases, will indicate these contacts.

Mailing List: To ensure that information materials reach the individuals who are interested in or affected by the cleanup activities at PNS, the Navy maintains and regularly updates the site mailing list.

Regular Contact with Local Officials: The Navy arranges regular meetings to discuss the status of the IR Program with the RAB.

Press Releases and Public Notices: The Navy issues press releases and public notices as needed to local media sources to announce public meetings and comment periods and the availability of reports and to provide general information updates.

Public Meetings: The Navy conducts informal public meetings to keep residents and town officials informed about cleanup activities at PNS and significant milestones in the IR Program. Meetings are conducted to explain the findings of RIs, to explain the findings of FSs, and to present Proposed Plans, which explain the preferred alternatives for cleaning up individual sites.

Fact Sheets and Information Updates: The Navy develops fact sheets to mail to public officials and other interested individuals and/or to use as handouts at public meetings. Fact sheets are used to explain certain actions or studies, to update readers on revised or new health risks, or to provide general information on the IR Program process.

Responsiveness Summary: The Responsiveness Summary for the Proposed Plan summarizes public concerns and issues raised during the public comment period and documents the Navy's formal

responses. The Responsiveness Summary may also summarize community issues raised during the course of the FS.

Announcement of the ROD: The notice of the final ROD will be published by the Navy in a major local newspaper prior to commencement of the selected remedial actions.

Public Comment Periods: Public comment periods allow the public an opportunity to submit oral and written comments on the proposed cleanup options. Citizens have at least 30 days to comment on the Navy's preferred alternatives for cleanup actions as indicated in the Proposed Plan.

Technical Assistance Grant: A Technical Assistance Grant from the USEPA can provide up to $50,000 to a community group to hire technical advisors to assist them in interpreting and commenting on site reports and proposed cleanup actions. A Technical Assistance Grant has been awarded for a community organization.

Site Tours: The PNS Public Affairs Office periodically conducts site tours for media representatives, local officials, and others.

A notice of availability of the Proposed Plan for OU2 was published on July 21, 2011, in the Portsmouth Herald and Fosters Daily Democrat. The Proposed Plan and other documents related to these sites are available to the public at the PNS Information Repositories located at the Portsmouth Public Library in Portsmouth, New Hampshire, and Rice Public Library located in Kittery, Maine. The notice also announced the start of the 30-day public comment period that was to end on August 19, 2011. The public comment period was extended by request until September 19, 2011. A notice to announce the extension of the public comment period was published on September 1, 2011 in the Portsmouth Herald and Fosters Daily Democrat. A copy of the notices and the Proposed Plan are included in Appendix B of this ROD.

The Proposed Plan notice of availability invited the public to attend a public meeting at the Kittery Town Hall in Kittery, Maine, on August 10, 2011. The public meeting presented the proposed remedies and solicited oral and written comments. At the public meeting, personnel from the Navy, USEPA, and MEDEP answered questions from the attendees during the informal portion of the meeting. In addition, public comments on the Proposed Plan were formally received and transcribed. The transcript from the public meeting is provided in Appendix C. Responses to the comments received during the public comment period are discussed in the Responsiveness Summary in Section 3.0 of the ROD.

2.4 SCOPE AND ROLE OF OPERABLE UNIT

OU2 is part of a comprehensive environmental investigation and cleanup program currently being performed at PNS. In accordance with Section 120(e) of CERCLA, an FFA was entered into between the Navy and USEPA in 1999. Eleven IR Program sites are included in the IR Program at PNS. Ten of the sites (excluding Site 30) are included within one of the seven OUs at PNS. Final decisions regarding remedial actions have been made for Sites 8, 9, and 11 in the OU3 ROD (2001) and for Site 10 in the OU1 ROD (2010). Sites 6 and 29 are within OU2, which is the subject of this ROD. Sites in the RI/FS stage include Sites 5 (OU4), 31 (OU8), 32 (OU7), and 34 (OU9). A non-time critical removal action is being conducted at Site 30. The Site Management Plan for PNS further details the schedule for the IR Program activities and is updated annually.

OU2 addresses past releases of contamination from open storage of batteries and other materials at Site 6 and open burning, industrial incineration, and waste disposal at Site 29. Investigations at OU2 indicated the presence of soil contamination that poses potential unacceptable risk to human health and the environment. Previous OU2 remedial actions included installation of an interim impermeable cap at Site 6, removal actions at Site 6 to stabilize the shoreline along the DRMO Storage Yard and the area west and east of the seawall at Site 29, and a removal action for lead- and copper-contaminated soil in the DRMO Impact Area.

Remediation of soil contamination in the DRMO Impact Area was evaluated in the 2009 EE/CA. 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 released for unrestricted use and unlimited exposure. The soil removal was conducted in 2010, and the contaminated soil was disposed of off site. With the removal of 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.

The remedies documented in this ROD will achieve the remedial action objectives (RAOs) for Sites 6 and 29, as listed in Section 2.8. Implementation of these remedies will allow continued use of the site to support base operations, which is consistent with the current and reasonably anticipated future industrial use of these sites and the overall cleanup strategy for PNS of restoring sites to support base operations.

2.5 SITE CHARACTERISTICS

2.5.1 Physical Characteristics

OU2 is located in the south-central portion of PNS along the Piscataqua River. Most of OU2 is used for industrial activities, but the northern portion of OU2 contains military residences. OU2 is approximately 7 acres; Site 6 encompasses 3 acres, Site 29 encompasses 1 acre, and the DRMO Impact Area encompasses the remaining 3 acres.

OU2 elevations are highest in the DRMO Impact Area (northern portion of OU2) and decrease toward the PNS southern coastline. The elevation change across OU2 is approximately 15 to 30 feet. The majority of OU2, including the DRMO Storage Yard, area around Building 298, and waste disposal area, is relatively flat with average elevations around 110 feet (based on 2002 PNS Vertical Datum which equates mean high water to 100.36 feet). The OU2 shoreline is within the 100-year flood zone of the Piscataqua River and 100-year coastal flood zone based on wave action (elevation 105 feet and 109 feet 2002 PNS Vertical Datum, respectively).

Asphalt and an interim cap cover Site 6. The interim cap is covered by grass and surrounded by Jersey barriers on the eastern and northeastern sides, with a fence closing off the remaining area to prohibit access. The waste disposal area is covered with grass or asphalt and includes Building 310. The area around Building 298 is covered with asphalt. Building 298 is used for office space, and Building 310 is a hose-handling facility. The DRMO Impact Area is the residential area covered with houses, grass, and roads. 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.

Within the DRMO area, soil with an average thickness of 6 feet overlies a rock fragment fill layer with little soil. Within the interim capped area and west of Building 298, soil in some areas extends deeper than 6 feet. The soil layer in the waste disposal area ranges in thickness from 2 to 10 feet and overlies waste material that ranges in thickness from 2 to 40 feet.

As stated in Table 2-1, OU2 provides little habitat for ecological receptors. No known endangered, threatened, or protected species or critical habitats are located within the boundaries of PNS, including OU2.

The shoreline of OU2 along the Piscataqua River spans 1,100 feet and is steeply sloped. A seawall, riprap, and other erosion devices (A-jacks) protect the shoreline from erosion. The seawall is approximately 12 feet high and 300 feet long, running just east of Building 298 to the end of the point where the coastline angles to the southeast. Only a small intertidal area is present to the east of OU2, but little sediment is present in this area. Surface water off shore of OU2 is saline and is not used for

drinking. The short-nosed sturgeon is a federally endangered species found along the eastern seaboard, but has no critical habitats located within the State of Maine.

2.5.2 Conceptual Site Model

Figure 2-2 presents the OU2 conceptual site model, which identifies contaminant sources, transport routes, and potential receptors. The primary sources of contamination at OU2 are from past open storage of hazardous material in the DRMO area and activities associated with open burning, industrial incineration, and waste disposal in the waste disposal area.

Site-related releases to fill material in the DRMO Storage Yard before 1983 resulted from the storage of lead and nickel-cadmium battery cells and plates stockpiled on uncovered pallets. During this time, other equipment and materials stored at the DRMO Storage Yard in unpaved areas may have leaked, resulting in contaminant releases to soil. Before the fence between the DRMO Storage Yard and Quarters S and N was erected (in the 1950s), storage activities may have occurred in the area adjacent to the DRMO Storage Yard or snow plowing may have pushed contaminated soil from the DRMO Storage Yard to the area adjacent to the DRMO Storage Yard. West of the DRMO Storage Yard, loading and offloading activities may have resulted in contaminant releases, and snow plowing may have pushed contaminated soil from the DRMO Storage Yard to this area.

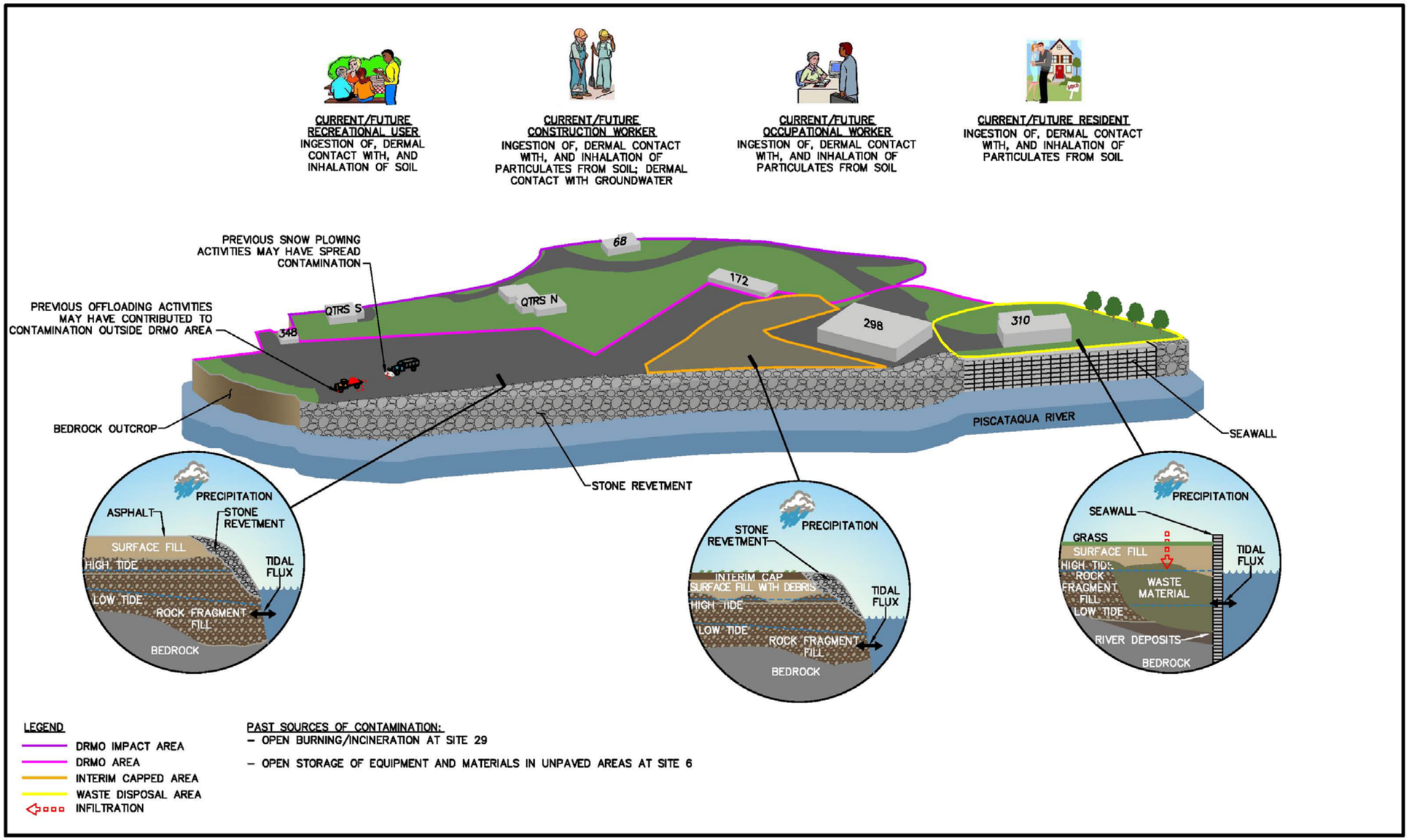
Open burning of trash was conducted in the waste disposal area from approximately 1918 until 1965, when the incinerator was built. The incinerator was used to burn trash, primarily wood, paper, household waste, and occasionally cans of paint and solvents until 1975. The waste disposal area was filled with material such as metal debris, steel, garbage, and ash from open burning within the area and from the incinerator located north of the area; filling activities in this area ended before 1980. The waste material was observed from several feet bgs to the top of bedrock or rock fragment fill, and most of the waste material is in the saturated zone.

Before asphalt and impermeable cap were present at Site 6, infiltration of precipitation through contaminated soil in the unsaturated zone and stormwater runoff over exposed contaminated soil were past migration pathways that could have transported contamination to groundwater and the offshore area. In grass-covered areas of Site 29 (in the waste disposal area), infiltration of precipitation through contaminated soil and waste material in the unsaturated zone is a past and current migration pathway; however, most of the contamination in this area is below high tide and therefore, this is not a significant migration pathway. Stormwater runoff over exposed contaminated soil may have been a past migration pathway at Site 29 but is not a current migration pathway because the soil is covered with grass, pavement, or a building.

Groundwater at OU2 is tidally influenced by river water that infiltrates the site twice daily. Groundwater at OU2 is brackish/saline and is not a potable source of water. Based on the risk evaluation for human health, groundwater exposure does not pose unacceptable risks. Migration of contamination from onshore to offshore areas through groundwater migration or shoreline erosion is a future potential migration pathway.

For Site 6, which is paved or capped, the only current exposure would be for a construction worker exposed to surface and subsurface soil during construction activities. There would be future potential for occupational workers to be exposed to surface soil if the asphalt or interim cap was removed or compromised such that surface soil was exposed. Access to the DRMO Storage Yard is restricted; therefore, recreational exposure is not a current concern for this area. 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 current potential exposure concerns. Quarters S, N, and 68 within the DRMO Impact Area are used for military residents. Although Sites 6 and 29 are located in an industrial area of the Shipyard, residential use of these sites was considered a hypothetical future use. Because of the steep slope of the OU2 shoreline, rocky nature of the shoreline, and the fast current of the Piscataqua River off shore of OU2, recreational use of the OU2 offshore area was not considered a potential exposure scenario.

FIGURE 2-2. CONCEPTUAL SITE MODEL



2.5.3 Nature and Extent and Fate and Transport of Contamination

As discussed in the Supplemental RI Report for OU2, the primary contaminant sources at OU2 are associated with the storage of materials and equipment at the DRMO Storage Yard and disposal of waste materials in the waste disposal area. Secondary contamination in the DRMO has resulted from snow plowing and loading and offloading of materials for storage at the DRMO Storage Yard. Soil contaminants identified at Sites 6 and 29 are antimony, copper, lead, nickel, dioxins/furans, PCBs, and PAHs. Lead was detected at concentrations greater than residential risk screening levels and background concentrations across the largest area, and therefore lead contamination defines the maximum extent of soil contamination at Sites 6 and 29. Lead, copper, and PCBs were identified as the primary contaminants. Soil contaminants were found at greatest concentrations within the DRMO Storage Yard, area capped in 1993, and waste disposal area. Detections of lead greater than 15,000 milligrams per kilograms (mg/kg) were found in soil in these areas. Outside of these areas, lead concentrations generally were less than 2,000 mg/kg. Within the part of the site paved during the 1993 interim measures, elevated copper concentrations (greater than 10,000 mg/kg) were detected in an area where the fill material included slag in the top 2 to 3 feet beneath the asphalt. Elevated copper concentrations were also detected in the capped area and waste disposal area. Areas of soil with PCB concentrations greater than 10 mg/kg were found in the capped area and waste disposal area and in portions of the DRMO Storage Yard. Potential lead contamination from the DRMO Storage Yard (associated with snow plowing and loading and offloading of materials) may be present in an area immediately west of the DRMO Storage Yard. This potential contamination will be delineated as part of the RD. The potential contamination in this area (based on limited sampling completed as part of the RI) indicates that contamination is similar to the DRMO Storage Yard; however, concentrations are generally lower and detections are more sporadic. Therefore, the alternatives evaluated in the FS Report can also be applied to this area.

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 during the 2010 removal action.

Contaminant fate and transport modeling to evaluate the potential for soil contaminants to leach to groundwater and subsequently migrate to the offshore area was conducted as part of the RI. The modeling conclusions indicate that the offshore area would not be adversely impacted by onshore sources of contamination. Groundwater, surface water, sediment, and soil data collected for OU2 and the OU2 offshore area support the modeling conclusions. It is unlikely that migration of contamination in groundwater would result in future unacceptable risks based on the age of the contaminant release, the high rate of dilution associated with the river, and fast river currents limiting potential contaminant accumulation in the offshore area. However, there is uncertainty in this conclusion for future contaminant migration from the capped area if the impermeable cap is removed and highly contaminated soil (i.e., lead was detected at concentrations greater than 100,000 mg/kg) in the unsaturated zone remains in place. Therefore, there could be a potential future risk for migration of highly contaminated soil from this area if the cap was removed or damaged.

The conclusions of the modeling and erosion of metal debris and soil observed along the shoreline adjacent to the east of Site 29 (at MS-11 Location 3) indicated that elevated chemical concentrations in sediment likely resulted from past erosion of contaminated soil in the eastern portion of Site 29 rather than from discharge of contaminated groundwater from OU2 to surface water and then deposition in sediment in the offshore intertidal zone. Erosion controls are in place along the entire OU2 shoreline and sediment accumulation along and adjacent to the OU2 shoreline has not been observed. However, the long-term stability of the shoreline controls is necessary to prevent future erosion as long as contaminated soil remains adjacent to the shoreline of OU2. Therefore, there is potential future risk to the off shore from erosion should the controls fail and soil erosion cause deposition in the offshore area adjacent to OU2.

2.6 CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

The current land use patterns at PNS are well established and are not expected to change in the foreseeable future. Industrial areas that support maintenance of submarines are in the western portion of the facility, and includes all of the dry docks and submarine berths and numerous buildings that house trade shops related to the maintenance activities. Use of other portions of PNS include administration offices, officers' residences, equipment storage, parking, and recreational facilities.

Sites 6 and 29 currently and historically have been used for industrial activities, and the DRMO Impact Area includes residences for military personnel, roads, and a parking area. Since the DRMO Storage Yard was moved to another location in 2010, a portion of the Site 6 area is used for Shipyard contractors' trailer parking. The remaining portion is not in use; however, the Shipyard plans to use the property for industrial activities. Site 29 is used for office space (Building 298) and industrial operations (hose handling facility in Building 310). Future uses of these sites are expected to be consistent with current uses. Based on the PNS land use map, a portion of the DRMO Storage Yard has archeological potential. This area is identified on the map as being on the original island; however, soil boring logs in this area indicate fill material and not native soil.

PNS does not use groundwater for any purpose. Potable water is supplied to PNS from the Kittery Water District, which uses surface reservoirs located in the vicinity of York, Maine. Groundwater at the site is tidally influenced and is not suitable for human consumption. The Piscataqua River is saline and is not suitable for human consumption. Various vessels operate in Portsmouth Harbor including commercial tankers, cargo ships, fishing trawlers, lobster boats, recreational vessels, and submarines located at PNS. Commercial and recreational fishing occur in the harbor, including in the vicinity of PNS.

2.7 SUMMARY OF SITE RISKS

The baseline risk assessment estimates what risks the site poses if no action was taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. A human health risk assessment (HHRA) was conducted in 2000 to estimate the probability and magnitude of potential adverse human health effects from exposure to contaminants associated with the site. Because surface water and sediment in the offshore area of OU2 is not easily accessible from OU2, risks from recreational exposure to these media were not included in the HHRA.

In 1992, an onshore ecological risk assessment for PNS was conducted that included evaluation of OU2. Terrestrial and avian biota surveys for PNS and limited tissue and vegetation sampling and vegetation surveying for OU2 were conducted as part of the risk assessment. The offshore area is included as part of OU4; therefore, an offshore ecological risk assessment was not conducted as part of OU2. Risks from past releases of contamination in the offshore area of OU2 are being addressed under OU4.

2.7.1 Summary of Human Health Risk

The quantitative 2000 HHRA was conducted using chemical concentrations detected in soil samples at Site 6, Site 29, and the DRMO Impact Area, and OU2 groundwater. Site 6, Site 29, and DRMO Impact Area were considered individually when calculating risks. Key steps in the risk assessment process included identification of chemicals of potential concern (COPCs), exposure assessment, toxicity assessment, and risk characterization. Tables D-1 through D-6 included in Appendix D.1 (originally presented in the 2000 HHRA) provide the risk data and associated results from the 2000 HHRA.

As summarized in Table 2.1, during the 2007/2008 Additional Investigation, lead and copper contamination from past DRMO Storage Yard operations was detected in a portion of the DRMO Impact Area. The extent of the lead- and copper-contaminated soil in the DRMO Impact area (in the backyards of Quarters S and N) was delineated, and the contaminated soil was excavated and disposed of off site as part of the 2010 removal action. The risk-based removal action goals were based on current and future anticipated residential site use. Post-removal residential risks for lead and copper exposure at

Quarters S and N were calculated and are also discussed herein. Tables summarizing data used in post-removal residential risk calculations and associated results are presented in Appendix D.2.

Identification of Contaminants of Potential Concern

Table D-2 includes the exposure point concentrations (EPCs) for the COPCs identified in surface soil and subsurface soil at Site 6. Table D-3 includes the EPCs for the COPCs identified in surface soil and subsurface soil at Site 29. Table D-4 includes the EPCs for the COPCs identified in surface and subsurface soil at the DRMO Impact Area. Appendix D.2 provides the COPC selection table and post-removal EPCs for lead and copper at Quarters S and N. Table D-5 includes the EPCs for the COPCs identified in OU2 groundwater for the dermal exposure pathway. No volatile COPCs were identified for groundwater (inhalation pathway).

EPCs are the concentrations used in the risk assessment to estimate exposure and risk from each COPC. For each COPC, information in the tables includes the EPC and how the EPC was derived. Based on the statistical distributions of the data and the results of the preliminary calculations, with the exception of lead, maximum detected concentrations or 95-percent upper confidence limits (UCLs) on the mean were used as the EPCs for COPCs. As recommended in USEPA guidance [Integrated Exposure Uptake Biokinetic (IEUBK) Model and Technical Review Workgroup (TRW) Adult Lead Model guidance], the arithmetic mean was used as the EPC for lead.

Exposure Assessment

During the exposure assessment, current and potential future exposure pathways through which humans might come into contact with the COPCs identified in the previous step were evaluated. The results of the exposure assessment for OU2 were used to refine the conceptual site model (Figure 2-2). Surface soil, subsurface soil, and groundwater were identified as the media of concern. Potential exposure routes for soil include incidental ingestion (swallowing small amounts of soil), dermal contact (skin exposure), and inhalation of air/dust particulates and vapors. Possible exposure routes for groundwater include dermal contact and inhalation during excavation. The 2000 HHRA considered receptor exposure under non-residential land use (construction and occupational workers and recreational users) and residential land use (current/future military resident at DRMO Impact Area and hypothetical future residents at all sites). Current and hypothetical future exposure pathways at OU2 (all sites) are summarized in Table 2-2.

TABLE 2-2. RECEPTORS AND EXPOSURE ROUTES EVALUATED IN HHRA

RECEPTOR	EXPOSURE ROUTE
Construction Workers (current/future land use)	Soil ingestion and dermal contact (surface and subsurface) Soil inhalation of air/dust particulates and vapors (surface and subsurface) Groundwater dermal contact (during excavation) Groundwater inhalation of volatiles (during excavation)
Occupational Workers (current/future land use)	Soil ingestion and dermal contact (surface soil) Soil inhalation of air/dust particulates and vapors (surface soil)
Recreational Users (current/future land use)	Soil ingestion and dermal contact (surface soil) Soil inhalation of air/dust particulates and vapors (surface soil)
Military Residents (current/future land use for DRMO Impact Area)	Soil ingestion and dermal contact (surface soil) Soil inhalation of air/dust particulates and vapors (surface soil)
Hypothetical Future Resident (future land use)	Soil ingestion and dermal contact (surface soil) Soil inhalation of air/dust particulates and vapors (surface soil)

Toxicity Assessment

Toxicity assessment involves identifying the types of adverse health effects caused by exposure to site COPCs and determining the relationship between the magnitude of exposure and the severity of adverse effects (i.e., dose-response relationship) for each COPC. Based on the quantitative dose-response relationships determined, toxicity values for both cancer (cancer slope factor [CSF]) and non-cancer (reference dose [RfD]) effects were derived and used to estimate the potential for adverse effects. Table D-1 provides the OU2 COPC carcinogenic risk and non-carcinogenic hazard information.

For carcinogenic risks, CSFs are not available for the dermal route of exposure; therefore, dermal slope factors were extrapolated from oral values. An adjustment factor is sometimes applied to extrapolate the dermal values from oral values, dependent on how well the chemical is absorbed via the oral route. However, no adjustment factors were required for the Site 6 carcinogenic COPCs with dermal slope factors; the oral CSFs were used as the dermal CSFs. For non-carcinogenic risks, the chronic toxicity data available for oral exposure to these COPCs have been used to develop oral RfDs ranging from 2 x 10^{-5} to 7 x 10^{-2} mg/kg-day. Dermal RfDs range from 2 x 10^{-5} to 8 x 10^{-4} mg/kg/day. The available toxicity data indicate the primary target organ affected by each COPC, and this information is provided in Table D-1. Dermal RfDs were extrapolated from oral RfDs by applying an adjustment factor as appropriate. Adjustment factors varied by chemical and ranged from 0.007 to 1.

Because published toxicity criteria are not available for lead, exposure to lead in soil was evaluated using the IEUBK Model and TRW Adult Lead Model for residential and non-residential exposure scenarios, respectively, as recommended by USEPA. The blood-lead concentration of a receptor is considered a key indicator of the potential for adverse health effects from lead contamination. The IEUBK and TRW Models calculate the probability of a receptor's blood-lead level exceeding 10 microgram per deciliter (µg/dL), the minimum concentration considered to be a "concern." In addition, the USEPA goal is to limit the risk (i.e., probability) of exceeding a 10 µg/dL blood-lead concentration to 5 percent of the population. Average lead concentrations and default parameters for some input parameters were used in the evaluations. The IEUBK Model for lead is designed to estimate blood levels of lead in children (under 7 years of age), and using the TRW model, adult exposure to lead in soil is addressed by evaluating the relationship between site soil lead concentrations and blood-lead concentrations in developing fetuses of adult women. No models were available to evaluate periodic exposure of adolescent trespassers/recreational users to lead; therefore, the results of the IEUBK Model for children were used to qualitatively assess exposure of this receptor because potential adverse effects from exposure to lead are expected to be of a lesser magnitude for adolescents than for children. Results of the IEUBK and TRW Adult Lead Model analyses are provided in Table D-6 (from Appendix I of the 2000 HHRA), and post-removal results of the IEUBK Model analysis for Quarters S and N are provided in Appendix D.2.

Risk Characterization

During the risk characterization, the outputs of the exposure and toxicity assessments are combined to characterize the baseline risk (cancer risks and non-cancer hazards) at the site if no action was taken to address the contamination. Potential cancer risks and non-cancer hazards were calculated based on reasonable maximum exposure (RME) and central tendency exposure (CTE) assumptions. The RME scenario assumes the maximum level of human exposure that could reasonably be expected to occur, and the CTE scenario assumes a median or average level of human exposure.

For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the carcinogen. Excess lifetime cancer risk is calculated from the following equation:

$$Risk = CDI \times SF$$

where: risk = a unitless probability (e.g., 2 x 10^{-5}) of an individual developing cancer
CDI = chronic daily intake averaged over 70 years (in mg/kg-day)
SF = slope factor (in mg/kg-day^{-1})

These calculated risks are probabilities that are usually expressed in scientific notation (e.g., 1 x 10^{-6}). An excess lifetime cancer risk of 1 x 10^{-6} under an RME scenario indicates that an individual experiencing the reasonable maximum exposure estimate has an "excess lifetime cancer risk" because it would be in addition to the risks of cancer individuals face from other causes such as smoking or exposure to too much sun. The chance of an individual developing cancer from all other causes has been estimated to be as high as one in three. USEPA's generally acceptable risk range for site-related exposures is 1 x 10^{-6} to 1 x 10^{-4}.

The potential for non-carcinogenic effects is evaluated by comparing an exposure level over a specified time period (e.g., a lifetime) to an RfD derived for a similar exposure period. An RfD represents a level to which an individual may be exposed that is not expected to cause any deleterious effect. The ratio of exposure dose to the RfD is called a hazard quotient (HQ). An HQ less than 1 indicates that a receptor's dose of a single contaminant is less than the RfD and that toxic non-carcinogenic effects from that chemical are unlikely. The hazard index (HI) is generated by adding the HQs for all chemicals that affect the same target organ (e.g., liver) or that act through the same mechanism of action within a medium or across all media to which a given individual may be reasonably exposed. An HI less than 1 indicates that, based on the sum of all HQs from different contaminants and exposure routes, toxic non-carcinogenic effects from all contaminants are unlikely. An HI greater than 1 indicates that site-related exposures may present a risk to human health. The HQ is calculated as follows:

$$\text{Non-cancer HQ} = \text{CDI} / \text{RfD}$$

where: CDI = chronic daily intake
RfD = reference dose

CDIs and RFDs are expressed in the same units and represent the same exposure period (i.e., chronic, sub-chronic, or short-term).

Site 6

Table D-2 provides RME cancer risk estimates for Site 6 surface and subsurface soil for the significant receptors and routes of exposure developed by taking into account various conservative assumptions about the frequency and duration of exposure for each receptor and also about the toxicity of the COPCs. Total risk estimates for all applicable exposure routes range from 1 x 10^{-5} for current and future construction workers to 1 x 10^{-4} for hypothetical future child residents. These risk levels indicate that if no cleanup action was taken, the increased probabilities of developing cancer as a result of site-related exposure would range from approximately 1 in 100,000 to 1 in 10,000. PAHs and a PCB (Aroclor-1254) were the main contributors to cancer risks.

Table D-2 also provides RME non-cancer HQs for the each receptor and route of exposure and total HIs for all routes of exposure. Total HIs for all applicable exposure routes range from 0.62 for current/future recreational users to 29 for hypothetical future child residents. For Site 6, no unacceptable non-cancer hazards were identified under the RME scenario for current/future adult recreational users exposed to soil. The Site 6 RME HI for the remaining receptors were greater than 1.0, with individual target organ HIs also exceeding 1.0. The primary contributors to non-cancer risks included a PCB (Aroclor-1254, which primarily affects the immune system) and antimony (primarily affects the blood system and may result in a decreased lifespan).

Table D-6 includes the lead model output results from Site 6. The predicted blood-lead levels for all receptors exceeded the USEPA goal of 10 µg/dL (ranged from 11 to 74 µg/dL), and the estimated probabilities of exceeding 10 µg/dL was greater than the USEPA goal of less than 5 percent (ranged from 10 to 100 percent).

No major sources of uncertainty, other than those typically associated with risk assessment estimates, were identified for the 2000 HHRA.

Site 29

Table D-3 provides RME cancer risk estimates for Site 29 surface and subsurface soil for the significant receptors and routes of exposure developed by taking into account various conservative assumptions about the frequency and duration of exposure for each receptor and also about the toxicity of the COPCs. Total risk estimates for all applicable exposure routes range from 4×10^{-6} for current and future adult recreational users to 4×10^{-5} for hypothetical future child residents. These risk levels indicate that if no cleanup action was taken, the increased probabilities of developing cancer as a result of site-related exposure would range from approximately 4 in 1,000,000 to 4 in 100,000. PAHs and dioxins/furans were the main contributors to cancer risks.

Table D-3 also provides RME non-cancer HQs for the each receptor and route of exposure and total HIs for all routes of exposure. Total HIs for all applicable exposure routes range from 0.029 for current and future child recreational users to 4.6 for current and future construction workers. The Site 29 RME HI for current and future construction workers and future child residents were greater than 1.0. Individual target organ HIs exceeded 1.0 for the current and future construction worker only. The primary contributor to non-cancer risks is antimony (primarily affects the blood system and may result in a decreased lifespan).

Table D-6 includes the lead model output results from Site 29. The predicted blood-lead level for a construction worker was 11 µg/dL, greater than the USEPA goal of 10 µg/dL. The predicted blood-lead levels for an occupational worker and recreational user (2.2 and 2.7 µg/dL, respectively) were less than the USEPA goal of 10 µg/dL, and the estimated probabilities of exceeding 10 µg/dL (1 and 2 percent, respectively) were less than the USEPA goal of less than 5 percent. The predicted blood-lead level for a resident (9.8 µg/dL) was less than the USEPA goal of 10 µg/dL and the estimated probability of exceeding 10 µg/dL (29 percent) was greater than the USEPA goal of less than 5 percent.

No major sources of uncertainty, other than those typically associated with risk assessment estimates, were identified for the 2000 HHRA.

DRMO Impact Area

Table D-4 provides RME cancer risk estimates for DRMO Impact Area surface and subsurface soil for the significant receptors and routes of exposure developed by taking into account various conservative assumptions about the frequency and duration of exposure for each receptor and also about the toxicity of the COPCs. Total risk estimates for all applicable exposure routes range from 2×10^{-6} for current and future construction workers and current and future adult recreational users exposed to surface and subsurface soil to 2.0×10^{-5} for hypothetical future child residents exposed to surface soil. These risk levels indicate that if no cleanup action was taken, the increased probabilities of developing cancer as a result of site-related exposure would range from approximately 2 in 1,000,000 to 2 in 100,000.

Table D-4 also provides RME non-cancer HQs for the each receptor and route of exposure and total HIs for all routes of exposure. Total HIs for all applicable exposure routes range from 0.012 for current and future adult recreational users to 0.9 for current and future child recreational users.

Table D-6 includes the lead model output results for the DRMO Impact Area. The predicted blood-lead levels for all receptors were less than the USEPA goal of 10 µg/dL (ranged from 2.1 to 4.6 µg/dL), and estimated probabilities of exceeding 10 µg/dL were less than the USEPA goal of less than 5 percent (ranged from 0.8 to 4.7 percent).

Lead and copper contamination from the DRMO Storage Yard was found to extend into the backyards of Quarters S and N. The extent of the lead- and copper-contaminated soil within the DRMO Impact Area (in the backyards of Quarters S and N) was delineated, and the contaminated soil was excavated and disposed of off site as part of the 2010 Removal Action. Post-removal risk information for lead and copper is provided in Appendix D.2. Risks from copper are acceptable because post-removal concentrations were less than the risk-based residential screening level. The predicted blood-lead levels for the residential based on the IEUBK model were less than the USEPA goal of 10 µg/dL (ranged from

2.1 to 2.9 µg/dL), and estimated probabilities of exceeding 10 µg/dL were less than the USEPA goal of less than 5 percent (ranged from 0.04 to 0.42 percent).

Groundwater

Because concentrations in groundwater were similar at Sites 6 and 29, potential risks from groundwater were evaluated on an OU-wide basis. Residential exposure to groundwater is very unlikely because the groundwater is not potable; therefore, residential exposure to groundwater was not evaluated in the risk assessment. Dermal contact with groundwater by construction workers was evaluated based on the assumption that workers may come into contact with groundwater during excavation or utility line repair activities. Table D-5 provides RME non-cancer risks and cancer risk estimates for construction worker exposure to groundwater. No unacceptable carcinogenic or non-carcinogenic risks were identified for construction worker exposure to groundwater at OU2.

2.7.2 Summary of Ecological Risk

An onshore ecological risk assessment was conducted for three areas (DRMO Storage Yard, Jamaica Island Landfill, and Meade Pond) at PNS. The objectives of the risk assessment as related to OU2 were to survey and characterize, in terms of composition and abundance, the terrestrial and avian biota, to sample and analyze tissues of biota for types of contaminants potentially related to site activities and disposal practices, to compare concentrations of COCs in media and biota to identify pathways of exposure and bioaccumulation, and to qualitatively evaluate potential risks to ecological receptors.

Rodent tissue and vegetation sampling and a vegetation survey were conducted for the DRMO Storage Yard area. A small mammal population survey for Jamaica Island Landfill was conducted, and the results were assumed to represent the small mammal population at PNS. A bird population survey was conducted for the three areas; however, birds observed were considered representative of birds at PNS and were not associated with specific areas. The environmental assessment concluded that the ecological habitats and communities present were representative of disturbed settings (developed areas). Some of the specific activities conducted during the onshore ecological risk assessment at OU2 and associated results are discussed below.

Observations of vegetation at OU2 were conducted. The vegetation did not appear to be stressed and was considered representative of that typically found in a natural field in primary succession. Because most of the DRMO Storage Yard was covered with pavement, vegetation was only found and sampled along the perimeter (along the fenceline) and on the hillside north of Building 172. Vegetation tissue sampling was conducted at OU2 (above-ground and below-ground portions were analyzed for inorganics and SVOCs). Vegetation tissue included morning glory, common buckthorn, forsythia, wild black cherry, salt meadow grass, and apple. Predominantly woody plants were present (85 percent).

Rodent tissue samples (four deer mice) were collected from the hillside north of Building 172. Therefore, the tissue samples may not have represented exposure to DRMO Storage Yard contamination.

The general conclusions of the onshore risk assessment were that the habitats observed were typical of developed areas and indicated that the ecological communities present in the onshore areas of PNS were healthy. The observed organisms and described communities appeared health and viable. In addition, the risk assessment concluded that although chemical concentrations in soil at OU2 may pose potential risks to animals and vegetation, an ecological impact was not observed.

2.7.3 Basis for Action

As a result of past activities at Sites 6 and 29, contamination is present in soil at these sites at concentrations that could result in unacceptable human health risks if action is not taken to prevent exposure to contaminated soil at Sites 6 and 29.

In addition to human health risks at the site, there are concerns associated with potential impacts to the OU2 offshore area from erosion and uncertainty as to the long-term stability of the shoreline controls placed along the OU2 shoreline. There are also future potential risks for contaminant migration to the OU2 offshore area. 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 infiltrated through highly contaminated unsaturated zone soil remaining in the capped area.

Based on the potential site risks, the COCs identified for OU2 are antimony, copper, lead, nickel, PAHs, and PCBs. Because risks were identified under current and future potential land use scenarios for human receptors and because potential future migration risks exist, a response action is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment that may present an imminent and substantial endangerment to public health or welfare.

2.8 REMEDIAL ACTION OBJECTIVES

RAOs are medium-specific goals that define the objective of conducting remedial actions to protect human health and the environment. RAOs specify the COCs, potential exposure routes and receptors, and acceptable concentrations (i.e., cleanup levels) for a site and provide a general description of what the cleanup will accomplish. RAOs typically serve as the design basis for the remedial alternatives described in Section 2.9. The RAOs developed for Sites 6 and 29 considering current and future land use at PNS are as follows:

- Prevent human exposure through ingestion, dust inhalation, and dermal contact to contaminated soil with COC concentrations that exceed cleanup levels.
- Protect the offshore environment from erosion of contaminated soil from the OU2 shoreline.
- Prevent unacceptable risk from future potential migration of copper, lead, and nickel from unsaturated zone soil in the capped area at Site 6 to groundwater.

The cleanup levels for construction workers, occupational workers, recreational users, and residents were developed in the OU2 FS. The cleanup goals are the chemical-specific goals for representative site concentrations (based on the exposure concentration) that, when achieved, will result in site concentrations that pose an acceptable risk for the targeted receptor. Cleanup levels were developed on a receptor-specific basis for protection of human health from exposure to soil contaminants. Cleanup levels were developed for soil COCs including antimony, copper, lead, nickel, PAHs [evaluated collectively as benzo(a)pyrene equivalents (BaPEqs)], and total PCBs. Dioxin/furan concentrations were less than residential and industrial remediation guidelines [Office of Solid Waste and Emergency Response (OSWER) Directive 9200.4-26]; therefore, they were not identified as COCs for remediation. The cleanup levels are based on average exposure concentrations in soil. Cleanup levels for COCs at Sites 6 and 29 are summarized in Table 2-3.

TABLE 2-3. CLEANUP LEVELS [1]

COC	CONSTRUCTION WORKER (MG/KG)	OCCUPATIONAL WORKER (MG/KG)	RECREATIONAL USER (MG/KG)	RESIDENT (MG/KG)
Antimony	516	681	3,930	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

1. A cleanup level is identified as “NA” for COCs that had acceptable levels for the identified receptor.

Except for the cleanup level for lead for a resident, the cleanup levels in Table 2-3 were developed in the OU2 FS Report using site-specific exposure assumptions and based on having a chemical-specific cancer risk less than 5×10^{-6} or an HI of 1 for non-carcinogens. The lead cleanup level for a resident is based on the OSWER soil screening level of 400 mg/kg for residential land use. All of the cleanup levels are based on average residual soil exposure concentrations, or EPCs, for the DRMO area and the waste disposal area. By remediating soil within the identified remediation areas, the resulting average soil exposure concentrations, or EPCs, would be less than the calculated site-specific risk-based cleanup levels or OSWER level for lead and would pose no unacceptable risks for the targeted receptors (construction workers, occupational workers, recreational users, and residents). Depths of remediation were based on the exposure depths evaluated in the HHRA, surface soil from 0 to 2 feet bgs and subsurface soil from 2 feet bgs to the top of the rock fragment fill layer, bedrock, water table, or 10 feet, whichever is shallower.

2.9 DESCRIPTION OF ALTERNATIVES

To address potential unacceptable human health risks associated with contamination at OU2, a preliminary technology screening evaluation was conducted in the FS. The general response actions are presented in Table 2-4.

TABLE 2-4. GENERAL RESPONSE ACTIONS

GENERAL RESPONSE ACTION	TECHNOLOGY	PROCESS OPTIONS
No Action	None	Not Applicable
Limited Action	LUCs	Active Controls: Physical Barriers/ Security Guards
		Passive Controls: Land Use Restrictions
	Monitoring	Long-Term Periodic Sampling
Containment	Surface Protection	Asphalt Cover
		Cap
Removal	Bulk Excavation	Excavation
Ex-Situ Treatment	Physical/Chemical	Soil Washing/Solvent Extraction
		Chemical Fixation/Solidification
	Solids Processing	Screening, Crushing, and Grinding
Disposal	Landfill/Recycling	Off-Yard Landfilling/Recycling

The technologies and process options retained after detailed screening were assembled into remedial alternatives. As stated above, the types and concentrations of contaminants at Site 6 and in the western portion of Site 29 are similar; therefore, the areas were combined for development of cleanup alternatives as part of the DRMO area. The remainder of Site 29 was evaluated as the waste disposal area. Five alternatives were evaluated to address contamination at the DRMO area, and four alternatives were evaluated to address contamination at the waste disposal area. Consistent with the NCP, the no action alternative was evaluated as a baseline for comparison with other alternatives during the comparative analysis. Tables 2-5 and 2-6 describe the major components and provide cost estimates for remedial alternatives developed for the waste disposal area and DRMO area, respectively.

TABLE 2-5. SUMMARY OF REMEDIAL ALTERNATIVES EVALUATED – WASTE DISPOSAL AREA			
ALTERNATIVE	**COMPONENTS**	**DETAILS**	**COST**
Alternative WDA-1: No Action *No action to address contamination and no use restrictions*	No action would be conducted	Five-year reviews would not be included under the No Action Alternative.	**Cost**: $0
Alternative WDA-2: LUCs and Monitoring *Current and future land use restrictions, groundwater monitoring, and sediment accumulation monitoring*	LUCs	Implementation of digging and access restrictions and prohibition of future residential use of the site.	**Capital**: $27,000 **30-Year NPW**: $382,000
		Implementation of requirements to ensure that site features (e.g., Building 310, shoreline stabilization features, and pavement) continue to prevent exposure to contamination. Inspection and operation and maintenance (O&M) would be conducted as necessary.	
		Implementation of requirements for the management of excavated soil during potential future construction activities.	
	Monitoring	Groundwater monitoring to provide confidence that lead, copper, and nickel in waste material is not migrating to groundwater at unacceptable levels.	
		Monitoring of accumulating offshore sediment along the shoreline of OU2 to provide confidence that contamination is not eroding such that it accumulates in the OU2 offshore area and could cause potential unacceptable offshore ecological risks.	
Alternative WDA-3: Surface Soil Removal and Soil Cover with LUCs and Monitoring *Excavation of contaminated soil from 0 to 2 feet bgs and construction of a soil cover with LUCs and monitoring*	Surface soil removal	Excavation and off-yard disposal of 1,700 cubic yards (cy) of soil and waste material from 0 to 2 feet bgs within the proposed soil cover limits, and excavation and off-yard disposal of 200 cy of soil and debris from the small pockets of contaminated soil adjacent to the proposed soil cover limits.	**Capital**: $1,211,000 **30-Year NPW**: $1,566,000
	Soil cover	Construction of a 2-foot-thick soil cover to prevent exposure to underlying contamination, without changing the ground surface elevations surrounding Building 310 or the associated parking and access features.	
	LUCs	Implementation of LUC requirements provided in Alternative WDA-2, and including restrictions to prevent unauthorized access to and digging within the proposed soil cover limits.	
	Monitoring	Groundwater and sediment monitoring as provided in Alternative WDA-2.	

TABLE 2-5. SUMMARY OF REMEDIAL ALTERNATIVES EVALUATED – WASTE DISPOSAL AREA

ALTERNATIVE	COMPONENTS	DETAILS	COST
Alternative WDA-4 Unsaturated Soil Removal and Soil Cover with LUCs and Monitoring *Excavation and off-yard disposal of unsaturated soil and waste material and construction of a soil cover with LUCs and monitoring*	Unsaturated soil removal	Excavation and off-yard disposal of 5,000 cy of soil and waste material located above the mean high groundwater table (an average depth of 6 feet bgs), except for near the foundation of Building 310, and excavation and off-yard disposal of 200 cy of soil and debris from the small pockets of contaminated soil adjacent to the proposed soil cover limits. Excavation adjacent to Building 310 would extend to 2 feet bgs where needed to protect the building foundation.	**Capital**: $2,619,000 **30-Year NPW**: $2,974,000
	Soil cover	Construction of a soil cover to prevent exposure to underlying contamination. The cover would be placed to establish pre-construction grades, elevations, and surface types.	
	LUCs	Implementation of LUC requirements provided in Alternative WDA-2, and including restrictions to prevent unauthorized access to and digging within the proposed soil cover limits.	
	Monitoring	Groundwater and sediment monitoring as provided in Alternative WDA-2.	

TABLE 2-6. SUMMARY OF REMEDIAL ALTERNATIVES EVALUATED – DRMO AREA

ALTERNATIVE	COMPONENTS	DETAILS	COST
Alternative DRMO-1: No Action *No action to address contamination and no use restrictions*	No action would be conducted	Five-year reviews would not be included under the No Action Alternative.	Cost: $0
Alternative DRMO-2: LUCs and Monitoring *Current and future land use restrictions, groundwater monitoring, and sediment accumulation monitoring*	LUCs	Implementation of digging and access restrictions and prohibition of future residential use of the site.	**Capital:** $29,000 **30-Year NPW**: $874,000
		Implementation of requirements to ensure that site features (e.g., Building 298, shoreline stabilization features, interim cap, and pavement) continue to prevent exposure to contamination. Inspection and O&M would be conducted as necessary.	
		Implementation of requirements for the management of excavated soil during potential future construction activities.	
	Monitoring	Groundwater monitoring to provide confidence that lead, copper, and nickel in soil is not migrating to groundwater at unacceptable levels.	
		Monitoring of accumulating offshore sediment along the shoreline of OU2 to provide confidence that contamination is not eroding such that it accumulates in the OU2 offshore area.	

TABLE 2-6. SUMMARY OF REMEDIAL ALTERNATIVES EVALUATED – DRMO AREA			
ALTERNATIVE	**COMPONENTS**	**DETAILS**	**COST**
Alternative DRMO-3 Residential Excavation with Off-Yard Disposal, LUCs, and Monitoring *Excavation and off-yard disposal of contaminated soil causing unacceptable risk based on residential exposure, with LUCs and monitoring.*	Residential excavation with off-yard disposal	Excavation and off-yard disposal of 32,000 cy of contaminated soil associated with potentially unacceptable residential risk, to the top of the rock fragment fill layer (an average depth of 6 feet) within the DRMO area, excluding soil beneath Building 298.	**Capital:** $16,082,000 **30-Year NPW:** $16,829,000
	Site restoration	Backfilling to establish pre-construction grades, elevations, and surface types using clean soil and pavement where necessary.	
	LUCs	Implementation of access restrictions to prevent exposure to soil beneath of Building 298.	
		Implementation of requirements to ensure that Building 298 is present to prevent exposure to contamination beneath Building 298.	
	Monitoring	Groundwater monitoring as provided in Alternative DRMO-2.	
Alternative DRMO-4 Construction Worker Excavation with Off-Yard Disposal, LUCs, and Monitoring *Excavation and off-yard disposal of all contaminated soil causing unacceptable risk based on construction worker exposure, except for under Building 298, with LUCs and monitoring*.	Construction worker excavation with off-yard disposal	Excavation and off-yard disposal of 12,000 cy of contaminated soil associated with potentially unacceptable construction worker risk, to the top of the rock fragment fill layer (an average depth of 6 feet), excluding soil beneath Building 298.	**Capital:** $6,366,000 **30-Year NPW**: $7,195,000
	Site restoration	Backfilling to establish pre-construction grades, elevations, and surface types using clean soil and pavement where necessary. The area formerly containing the interim cap would be restored to grades that promote positive drainage and match the surrounding grades of the DRMO area.	
	LUCs	Implementation of LUCs as provided in Alternative DRMO-2 except that dig and access restrictions would not be necessary except for under Building 298, and the interim cap would no longer be present.	
	Monitoring	Groundwater and sediment monitoring as provided in Alternative DRMO-2.	

TABLE 2-6. SUMMARY OF REMEDIAL ALTERNATIVES EVALUATED – DRMO AREA			
ALTERNATIVE	**COMPONENTS**	**DETAILS**	**COST**
Alternative DRMO-5 Construction Worker Excavation and RCRA C Cap with Off-Yard Disposal, LUCs, and Monitoring *Excavation and off-yard disposal of contaminated soil causing unacceptable risk based on construction worker exposure except for under Building 298 and within the interim cap area, and construction of an RCRA C cap system over contamination remaining in the interim cap area, with LUCs and monitoring.*	Excavation and off-yard disposal	Excavation and off-yard disposal of 5,500 cy of soil associated with potentially unacceptable construction worker risk, to the top of the rock fragment fill layer (an average depth of 6 feet) within the DRMO area, excluding soil located beneath Building 298 and in the interim capped area.	**Capital:** $4,467,000 **30-Year NPW**: $5,312,000
	Site restoration	Backfilling to establish pre-construction grades, elevations, and surface types using clean soil and pavement where necessary.	
	RCRA C cap system	Construction of a final cap over the contamination remaining in the limits of the existing interim cap meeting the requirements for a low-permeability cap established for the closure of landfills in the State of Maine.	
	LUCs	Implementation of LUCs as provided in Alternative DRMO-2 except that dig and access restrictions would only be required for under Building 298 and within the cap area. Inspection and O&M for the cap would also be included.	
	Monitoring	Groundwater and sediment monitoring as in Alternative DRMO-2	

2.10 COMPARATIVE ANALYSIS OF ALTERNATIVES

Tables 2-7 and 2-8 and subsequent text in this section summarize the comparison of the remedial alternatives with respect to the nine CERCLA evaluation criteria outlined in the NCP at 40 CFR 300.430 (e)(9)(iii) and categorized as threshold, primary balancing, and modifying. Further information on the detailed comparison of remedial alternatives is presented in the OU2 FS.

TABLE 2-7: 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?	MEDEP concurs with Alternative WDA-3 and a letter of concurrence is included in Appendix A.			
Community Acceptance What objections, suggestions, or modifications does the public offer during the comment period?	A comment received during the public comment period indicated a preference of Alternative WDA-4 over Alternative WDA-3. Public comments received and responses are provided in Appendix C.			

Relative comparison of the nine balancing criteria and each alternative:
● – Good , ◘ – Average, ○ – Poor; N/A – not applicable

TABLE 2-8: 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?	MEDEP concurs with Alternative DRMO-4 and a letter of concurrence is included in Appendix A.				
Community Acceptance ➢ What objections, suggestions, or modifications does the public offer during the comment period?	No opposition to Alternative DRMO-4 was received from the RAB members or community members.				
Relative comparison of the Nine Balancing Criteria and each alternative: ● – Good , ◘ – Average, ○ – Poor; N/A – not applicable;					

Threshold Criteria – Waste Disposal Area

Overall Protection of Human Health and the Environment. The No Action alternative would not achieve RAOs and would not protect human health and the environment; therefore, it is not discussed further in this ROD. All of the other alternatives would be protective of human health and the environment.

Both Alternatives WDA-3 and WDA-4 are consistent with current and reasonably anticipated industrial land use and would be equally protective and provide the most protection of human health and the environment because these alternatives would remove contaminated soil and install a cover system over the remaining contaminated material, preventing contact with this material and preventing migration of this material to the Piscataqua River by erosion. LUCs would be required under these two alternatives for the protection of the cover system. Additional excavation of soil under Alternative WDA-4 does not provide significant additional protection of human health and the environment than Alternative WDA-3. Alternative WDA-2 would be less protective of human health because the alternative relies only on LUCs (access and land use restrictions) to ensure continued protection.

Compliance with ARARs. Applicable or Relevant and Appropriate Requirements (ARARs) include any federal or state standards, requirements, criteria, or limitations determined to be legally applicable or relevant and appropriate to the site or remedial action. Alternatives WDA-2 through WDA-4 would meet all chemical-, location-, and action-specific ARARs.

Primary Balancing Criteria – Waste Disposal Area

Long-Term Effectiveness and Permanence. Alternatives WDA-3 and WDA-4 would be most effective because these alternatives would remove contaminated soil and construct a soil cover (barrier layer) over the remaining contaminated material in the waste disposal area. This cover system, along with LUCs and O&M of the cover system, would prevent human contact with the contaminated material and would prevent migration of contaminated material through erosion prevention. Continued implementation of LUCs under Alternative WDA-2 would be necessary to be effective in the long term.

Reduction in Toxicity, Mobility, or Volume Through Treatment. None of the alternatives considered would involve an active treatment process that would reduce the toxicity, mobility, or volume of COCs.

Short-Term Effectiveness. Alternative WDA-2 would have minimal short-term effectiveness concerns. Implementation of LUCs and long-term monitoring would not adversely impact the surrounding community or the environment. Alternatives WDA-3 and WDA-4 would have some short-term effectiveness concerns for remediation construction workers and the environment related to removal and processing of contaminated material. However, these concerns could be effectively controlled using personal protective equipment (PPE), compliance with proper site-specific health and safety procedures, and use of best management practices to prevent exposure to and migration of contamination during construction activities. Because Alternative WDA-4 involves excavation of more contaminated materials than Alternative WDA-3, Alternative WDA-4 would have a longer construction period and a greater potential for human health and environmental risks during construction. The estimated times for implementation of Alternatives WDA-2, WDA-3, and WDA-4 are 12, 14, and 16 months, respectively.

Implementability. Alternative WDA-2 would have relatively few implementation difficulties because this alternative would include only development of a LUC RD and long-term management plan to document the necessary LUCs, inspections, O&M, and monitoring. Both Alternative WDA-3 and Alternative WDA-4 involve the excavation and off-yard transportation and disposal of contaminated materials, in addition to the construction of a cover system. These activities would require additional access of vehicles to the Shipyard for transportation of excavated material off yard and transportation of materials on yard for the cover, which would require coordination with Shipyard personnel for access to the facility and traffic control at the site. Alternative WDA-4 would be considered the most difficult to implement because it requires excavation to a deeper depth than Alternative WDA-3 and because of additional construction concerns associated with protection of the Building 310 foundation during excavation.

Cost. The costs for Alternatives WDA-2, WDA-3, and WDA-4 are $382,000, $1,566,000, and $2,974,000, respectively.

Modifying Criteria – Waste Disposal Area

State Acceptance. State involvement has been solicited throughout the CERCLA process. MEDEP, as the designated support agency in Maine, concurs with the Selected Remedies.

Community Acceptance. One community group provided oral comments at the public meeting held on August 10, 2011 and written comments during the public comment period on the Proposed Plan. The group indicated preference for Alternative WDA-4 over Alternative WDA-3. However, no adverse comments were received that changed the preferred remedial alternative.

Threshold Criteria – DRMO Area

Overall Protection of Human Health and the Environment. The No Action alternative would not achieve RAOs and would not protect human health and the environment; therefore, it is not discussed further in this ROD. All of the other alternatives would be protective of human health and the environment.

Although Alternative DRMO-3 would be the most protective of human health and the environment because it would permanently removal most of the soil causing a potential unacceptable risk through excavation and off-yard disposal, it is not consistent with current and reasonably anticipated future land use. Both Alternatives DRMO-4 and DRMO-5 are consistent with current and reasonably anticipated industrial land use and would be protective of human health and the environment. These alternatives would address the portions of the DRMO area that contain contamination at concentrations that exceed acceptable levels for construction workers, which would also address potential risks to occupational and recreational users. Alternative DRMO-4 would remove all of this material for off-yard disposal, and Alternative DRMO-5 would remove part of this material and provided a permanent cap over the contaminated material remaining in the interim capped area. Alternatives DRMO-4 and DRMO-5 would use LUCs to prevent residential use. Alternative DRMO-4 is more protective than Alternative DRMO-5 because it removes the contaminated material in the interim capped area. Alternative DRMO-2 would be less protective than Alternative DRMO-5 because it relies on LUCs alone to ensure continued protection.

Compliance with ARARs. ARARs include any federal or state standards, requirements, criteria, or limitations determined to be legally applicable or relevant and appropriate to the site or remedial action. Alternatives DRMO-2 through DRMO-5 would meet all chemical-, location-, and action-specific ARARs.

Primary Balancing Criteria – DRMO Area

Long-Term Effectiveness and Permanence. Alternative DRMO-3 would be the most effective alternative because it would remove contaminated materials from most of the DRMO area, allowing for unrestricted use everywhere but beneath Building 298. Alternative DRMO-4 provides the next best long-term protection through the removal and off-yard disposal of contaminated materials (excluding beneath Building 298) that pose a risk based on current industrial site use, and the implementation of LUCs to restrict future residential site use. Alternative DRMO-5 would provide less long-term effectiveness and permanence than Alternative DRMO-4 because under Alternative DRMO-5, contaminated material would not be removed from the interim capped area. A cap system would be constructed over the contaminated material remaining in the interim capped area. Continued implementation of LUCs under Alternative DRMO-2 would be necessary to be effective in the long term.

Reduction in Toxicity, Mobility, or Volume Through Treatment. None of the alternatives being considered would involve an active treatment process that would reduce the toxicity, mobility, or volume of COCs. Alternatives DRMO-3, DRMO-4, and DRMO-5 may reduce the toxicity, mobility, or volume of

contaminants through treatment depending on the requirements for transportation of the excavated material for off-yard disposal.

Short-Term Effectiveness. Alternative DRMO-2 would have minimal short-term effectiveness concerns. Implementation of LUCs and long-term monitoring would not adversely impact the surrounding community or the environment. Alternatives DRMO-3, DRMO-4, and DRMO-5 would have some short-term effectiveness concerns for remediation construction workers and the environment related to removal and processing of contaminated material. However, these concerns could be effectively controlled using PPE, compliance with proper site-specific health and safety procedures, and use of best management practices to prevent exposure to and migration of contamination during construction activities. Because Alternative DRMO-3 involves excavation of more contaminated materials than Alternatives DRMO-4 and DRMO-5, Alternative DRMO-3 would have a longer construction period and a greater potential of putting human health and the environment at risk during construction. The estimated times for implementation of Alternatives DRMO-2 through DRMO-5 are 12, 24, 18, and 18 months, respectively.

Implementability. Alternative DRMO-2 would have relatively few implementation difficulties because it would include development of a LUC RD and long-term management plan to document the necessary LUCs, inspections, O&M, and monitoring. Alternative DRMO-3 would be considered the most difficult to implement because it would involve the excavation and off-yard transportation and disposal of most of the contaminated materials causing unacceptable residential risks. These activities would require significant additional access of vehicles to the Shipyard for transportation of excavated material off yard and transportation of materials on yard for the backfill soil, which would require coordination with Shipyard personnel for access to the facility and traffic control at the site Alternative DRMO-4 would require less transportation of materials on and off yard than Alternative DRMO-3, and Alternative DRMO-5 would require less transportation of materials than Alternative DRMO-4. Off-yard disposal truck traffic associated with Alternatives DRMO-3, DRMO-4, and DRMO-5 could be reduced by implementing on-site screening and re-use of large-sized particles (e.g., rocks).

Cost. The costs for Alternatives DRMO-2 through DRMO-5 are $874,000, $16,829,000, $7,195,000 and $5,312,000, respectively.

Modifying Criteria – DRMO Area

State Acceptance. State involvement has been solicited throughout the CERCLA process. MEDEP, as the designated support agency in Maine, concurs with the Selected Remedies.

Community Acceptance. One community group provided oral comments at the public meeting held on August 10, 2011 and written comments during the public comment period on the Proposed Plan. The group indicated support for Alternative DRMO-4. No adverse comments were received that changed the preferred remedial alternative.

2.11 PRINCIPAL THREAT WASTE

Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or that would present a significant risk to human health or the environment should exposure occur. A source material is a material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination to groundwater, surface water, or air, or acts as a source for direct exposure. The NCP at 40 CFR 300.430(a)(1)(iii)(A) establishes an expectation that treatment will be used to address the principal threats posed by a site wherever practicable. At OU2, contaminant concentrations are not highly toxic or highly mobile; therefore, principal threat wastes are not present at the site.

2.12 SELECTED REMEDIES

2.12.1 Rationale for Selected Remedies

Waste Disposal Area

The Selected Remedy for the waste disposal area at OU2 is Alternative WDA-3: Surface Soil Removal and Soil Cover with LUCs and Monitoring, which was selected because it provides the best balance of tradeoffs with respect to the nine evaluation criteria. Alternative WDA-3 was selected over the other alternatives because it provides the greatest long-term effectiveness and implementability considering the current and planned future industrial use of the site. Alternative WDA-3 will remove contaminated soil in the top 2 feet of soil, provide a physical barrier, and implement LUCs to prevent potential industrial and recreational exposure to underlying contamination rather than relying only on institutional or administrative controls to prevent potential exposure, as provided under Alternative WDA-2. Alternative WDA-3 provides less disruption of current operations and is more implementable than Alternative WDA-4, which would involve removal of additional contamination in the subsurface (to approximately 6 feet bgs) because of construction considerations necessary around Building 310. Because Alternative WDA-4 will rely on the same soil cover and LUCs as Alternative WDA-3, it would provide the same level of protection 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 with construction concerns associated with protection of the Building 310 foundation.

The principal factors in the selection of this remedy for the waste disposal area were as follows:

- Excavation to 2 feet bgs and placement of a soil cover will address potential unacceptable risks for current industrial site use without significant disturbance of Building 310. Waste material is mostly in the saturated zone; therefore, removal of additional unsaturated zone soil will not change the long-term effectiveness of the remedy.
- The remedy is consistent with the reasonably anticipated future industrial use of the site.
- The remedy achieves similar protection at a lower cost than additional excavation ($1,566,000 compared with $2,974,000).

DRMO Area

The Selected Remedy for the DRMO area at OU2 is Alternative DRMO-4: Construction Worker Excavation with Off-Yard Disposal, LUCs, and Monitoring, which was selected because it provides the best balance of tradeoffs with respect to the nine evaluation criteria. Alternative DRMO-4 is preferred over the other alternatives because it provides the greatest long-term effectiveness and implementability considering the current and planned future industrial use of the site. Alternative DRMO-4 will remove contaminated soil to prevent current site users from exposure to contaminated soil in the DRMO area and implement LUCs to prevent future exposure to contaminated soil under Building 298 and to prevent residential use of the DRMO area. Alternative DRMO-4 includes removal of contamination in the interim capped area to eliminate the future potential for migration of contamination from this area to groundwater. This will provide more long-term effectiveness than Alternative DRMO-5, which would have included a permanent cap in this area. Alternative DRMO-2 relies solely on LUCs to be protective of current and future site users. Current and future planned use of the DRMO area is not likely to be residential; therefore, Alternative DRMO-4 is preferred over Alternative DRMO-3, which would have included excavation of more soil to meet residential cleanup levels, because the higher costs and implementability and short-term effectiveness concerns associated with the large excavation area are not warranted.

The principal factors in the selection of this remedy for the DRMO area include the following:

- Excavation based on construction worker exposure will also address potential unacceptable risks for occupational worker and hypothetical recreational exposure to contaminated soil in the DRMO area.

This alternative was preferred because, by complete removal of the highly contaminated soil in the interim capped area, the potential future migration concern (for copper, lead, and nickel) will be eliminated.

- The remedy is consistent with the reasonably anticipated future industrial use of the site.
- The remedy achieves similar protection at a significantly lower cost than full-scale removal ($7,195,000 compared to $16,829,000).

DRMO Impact Area

No Further Action is the Selected Remedy for the DRMO Impact Area because contaminated soil within the DRMO Impact Area was removed in 2010, thereby eliminating potentially unacceptable risks from exposure to contaminated soil in this portion of OU2. Therefore, further action is not required to protect human health and the environment in the DRMO Impact Area.

2.12.2 Description of Selected Remedies

Waste Disposal Area

The Selected Remedy for the waste disposal area includes four major components: (1) surface soil removal and off-yard disposal of soil and waste material from within the proposed soil cover limits and the debris areas adjacent to the soil cover limits, (2) construction of a 2-foot-thick soil cover to prevent exposure to and erosion of underlying contaminated material, (3) implementing LUCs to ensure that site features to prevent erosion or exposure are present and intact, to restrict unauthorized access to and digging within the proposed soil cover limits, to require proper management of excavated soil during potential future construction activities, and to prevent residential exposure to soil, and (4) groundwater monitoring and sediment accumulation monitoring to provide confidence that potential contaminant migration does not cause potential unacceptable offshore ecological impacts.

Excavation will consist of removal of an estimated 1,700 cy of surface soil and debris within the proposed soil cover limits and 200 cy in the debris areas adjacent to the soil cover limits. Within the soil cover limits, soil will be excavated to a maximum depth of 2 feet bgs over an area of approximately 25,000 square feet, as shown on Figure 2-3. Excavation in the debris areas will be conducted until all of the debris has been removed above soil, bedrock, or rock fragment fill. Confirmation soil samples will be collected from the exposed ground surface and sidewalls, where soil is present, of any excavation that is outside of the proposed cover system to determine whether COC concentrations greater than the construction worker cleanup levels remain. If COC concentrations in confirmation samples from the small pockets of contaminated soil adjacent to the soil cover are greater than construction worker cleanup levels, the Navy in consultation with USEPA and MEDEP will determine whether additional excavation is necessary to eliminate unacceptable risks based on current industrial site uses. Factors to be considered will be presented in the remedial action documents such as calculating the EPCs for the COCs to determine whether the cleanup goals have been met. A 2-foot-thick soil cover will be constructed within the proposed soil cover limits, and the small areas of excavation outside of the proposed soil cover will be backfilled with clean fill to pre-excavation elevations. The planned cover system is shown on Figure 2-4. Building 310 and the shoreline stabilization area are critical existing site features that must remain on site as part of the remedy for the waste disposal area. Building 310 covers potentially contaminated soil beneath the building footprint, and the shoreline stabilization features minimize erosion of the shoreline to the offshore area. The Navy will prepare remedial action documents (design and work plan) that will specify the appropriate measures for excavation, confirmation sampling, construction of the soil cover, and site restoration.

LUCs will be implemented within the waste disposal area boundary through a LUC RD. The LUC boundary includes the proposed cover area and the stabilization shoreline area, as shown on Figure 2-3. Consistent with the RAOs developed for the site, the specific performance objectives for the LUCs to be implemented at the waste disposal area are as follows:

- To prohibit residential reuse of the site unless additional action is undertaken to prevent residential exposure to contamination. Prohibited residential uses shall include, but are not limited to, any form of housing, child-care facilities, pre-schools, elementary schools, secondary schools, playgrounds, convalescent, or nursing care facilities.
- To maintain current site features including Building 310, installed soil cover, and shoreline stabilization features unless additional action is undertaken to prevent exposure to contamination in the waste disposal area or to prevent erosion.
- To institute dig restrictions and provide requirements for proper management of excavated soil as part of any future construction and maintenance activities at the waste disposal area. Signage would be used as needed to alert the public to the presence of contamination and dig restrictions.

The LUCs will be implemented and maintained by the Navy until concentrations of hazardous substances in soil are at levels that allow for unrestricted use and unlimited exposure. Within 90 days of ROD signature, the Navy as lead agency shall develop, prepare, and submit to USEPA for review and approval a LUC RD as a primary document per the FFA that shall contain LUC implementation actions, including maintenance, monitoring and enforcement requirements that are consistent with the requirements under this ROD. The Navy is responsible for implementing, maintaining, reporting on, and enforcing the LUCs described in this ROD. Although the Navy may later transfer these procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Navy shall retain ultimate responsibility for the remedy integrity.

Although groundwater concentrations are at acceptable levels based on current conditions, post-remedial groundwater monitoring will be conducted to provide confidence that copper, lead, and nickel in waste material does not migrate to groundwater at unacceptable levels. During implementation of the Selected Remedy, groundwater monitoring wells will be protected to the extent possible. Groundwater monitoring wells disturbed during excavation activities will be replaced following excavation and soil cover construction. As part of a long-term management plan, a groundwater monitoring plan will be prepared that will provide the requirements for monitoring including sampling frequency, locations of wells, action levels, and monitoring exit strategy.

Although sediment accumulation along and adjacent to the OU2 shoreline has not been observed, post-remedial sediment accumulation monitoring will be conducted in the offshore area to provide confidence that contaminated material from the waste disposal area does not erode and migrate to the offshore area such that sediment accumulates in the intertidal area immediately east of Site 29 (the area most likely to have sediment accumulation from eroding material from OU2, if any does occur). The long-term management plan will provide the requirements for monitoring accumulating offshore sediment. This plan will identify the frequency of inspections and the area in which the inspections will take place.

DRMO Area

The Selected Remedy for the DRMO area includes four major components: (1) excavation and off-yard disposal of soil associated with potentially unacceptable risks to construction workers, (2) restoring excavated areas to establish pre-construction grades, elevations, and surface types, (3) implementing LUCs to provide requirements to ensure that site features to prevent erosion are present, to prevent exposure to soil beneath Building 298, and to prevent residential exposure to soil in the remainder of the DRMO area, and (4) groundwater monitoring and sediment accumulation monitoring to provide confidence that potential contaminant migration does not cause potential unacceptable offshore ecological impacts.

Excavation will consist of removal of an estimated 12,000 cy of contaminated soil associated with potentially unacceptable construction worker risk. The initial excavation area will be delineated based on lead concentrations exceeding 4,000 mg/kg and will include the portion on the western side of the DRMO area as necessary. Excavation of lead concentrations in excess of 4,000 mg/kg will result in post-remedial average exposure concentrations (i.e., EPC) that are less than the construction worker, occupational worker, and recreational user cleanup levels (2,000, 1,600 and 4,600 mg/kg, respectively).

FIGURE 2-3. WASTE DISPOSAL AREA SELECTED REMEDY

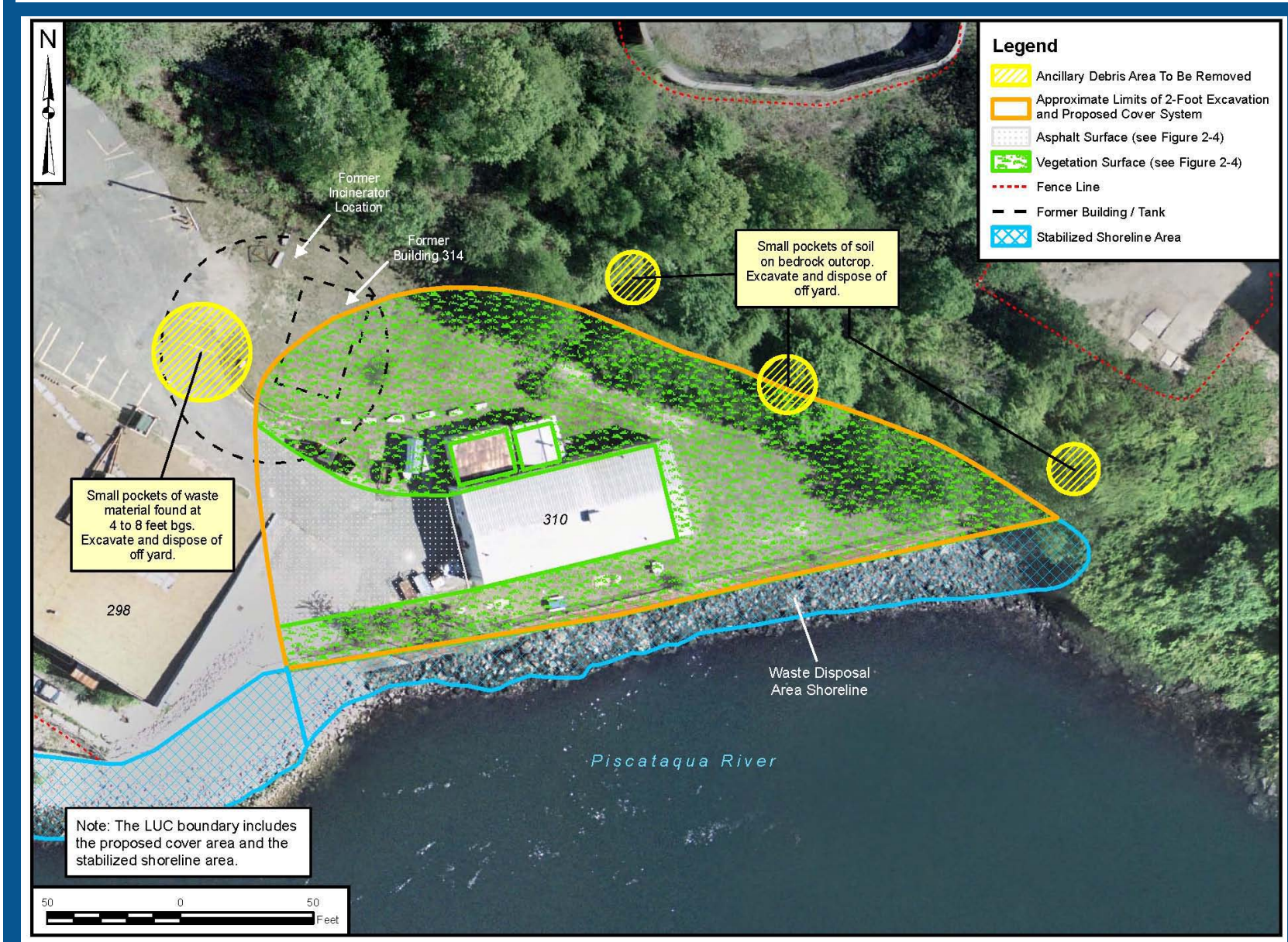
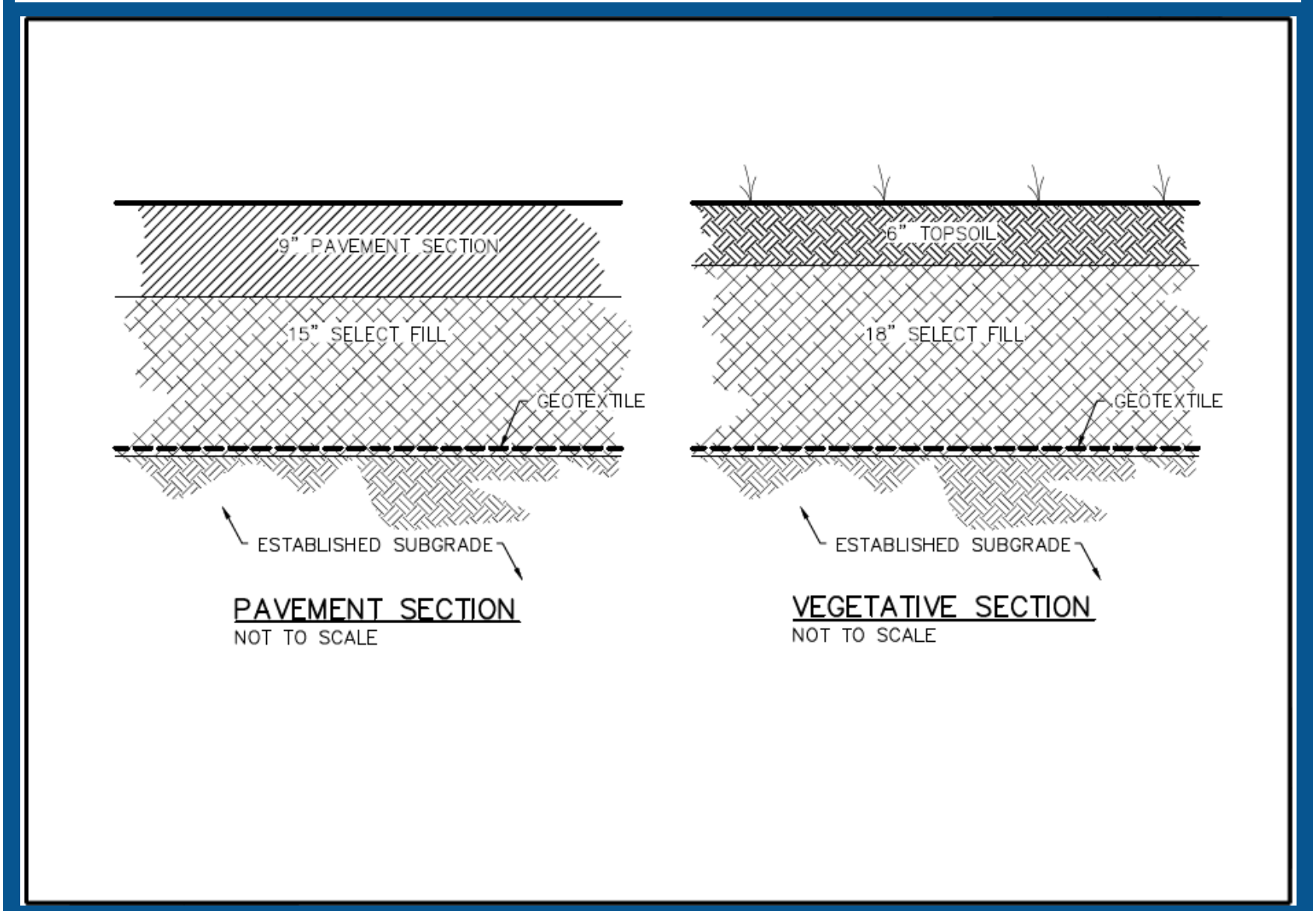


FIGURE 2-4. WASTE DISPOSAL AREA COVER SYSTEM DETAILS



Therefore, excavation of contaminated soil to eliminate unacceptable construction worker risks will also eliminate potentially unacceptable risks to occupational workers and hypothetical recreational users. Pre-design investigation data will be used to refine the western limits of the excavation area for the DRMO area. The RD will reflect any changes in excavation areas based on the pre-design investigation results. Excavation of contaminated soil will extend to a depth where there is very little soil and mostly rock (i.e., the rock fragment fill layer) or where contaminant concentrations are at acceptable levels for industrial land use. The top of the rock fragment fill layer has an average depth of 6 feet bgs, but may be as deep as 10 feet bgs in the interim capped area and west of Building 298. The estimated limits of excavation are shown on Figure 2-5 and include the interim capped area and area southwest of Building 298 but do not include the area under Building 298. Building 298 is a critical existing site feature that must remain on site to cover potentially contaminated soil beneath the building footprint. The upper portion of the shoreline revetment adjacent to the excavation area will be removed as needed to enable excavation of soil along the shoreline. Portions of the shoreline revetment removed as part of excavation activities will be replaced. The shoreline stabilization features minimize erosion of the shoreline to the offshore area as part of the remedy for the DRMO area. Confirmation soil samples will be collected from the exposed ground surface and sidewalls, where soil is present, following excavation and used to determine whether COC concentrations greater than construction worker cleanup levels remain. If COC concentrations in confirmation samples are greater than construction worker cleanup levels, the Navy in consultation with USEPA and MEDEP will determine whether additional excavation is necessary to eliminate unacceptable risks based on current industrial site uses. Factors to be considered will be presented in the remedial action documents such as calculating the EPCs for the COCs to determine whether the cleanup goals have been met. Excavated areas will be restored to establish pre-construction grades, elevations, and surface types using clean fill and pavement, as necessary, to be consistent with current and planned future site uses. Portions of the shoreline revetment removed as part of excavation activities will be replaced. The Navy will prepare remedial action documents (design and work plan) that will specify the appropriate measures for excavation, confirmation sampling, and site restoration.

LUCs will be implemented in the entire DRMO area through a LUC RD. The approximate LUC boundary at the DRMO area is shown on Figure 2-5. Pre-design investigation results will be used to refine the western limits of LUCs for residential use. The final LUC boundary provided in the LUC RD will reflect any changes in the LUC boundary based on pre-design investigation results. Consistent with the RAOs developed for the site, the specific performance objectives for the LUCs to be implemented at the DRMO area are as follows:

- To prohibit residential reuse of the site unless additional action is undertaken to prevent residential exposure to contamination. Prohibited residential uses shall include, but are not limited to, any form of housing, child-care facilities, pre-schools, elementary schools, secondary schools, playgrounds, convalescent, or nursing care facilities.
- To maintain current site features including Building 298 and the shoreline stabilization features unless additional action is undertaken to prevent exposure to contamination under Building 298 or to prevent erosion of contamination in the DRMO area.
- To provide requirements for proper management of excavated soil from the DRMO area as part of any future construction or maintenance activities.

The LUCs will be implemented and maintained by the Navy until concentrations of hazardous substances in soil are at levels that allow for unrestricted use and unlimited exposure. Within 90 days of ROD signature, the Navy as lead agency shall develop, prepare, and submit to USEPA for review and approval a LUC RD as a primary document per the FFA that shall contain LUC implementation actions, including maintenance, monitoring and enforcement requirements that are consistent with the requirements under this ROD. The Navy is responsible for implementing, maintaining, reporting on, and enforcing the LUCs described in this ROD. Although the Navy may later transfer these procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Navy shall retain ultimate responsibility for the remedy integrity.

FIGURE 2-5. DRMO AREA SELECTED REMEDY

Although groundwater concentrations are at acceptable levels based on current conditions, post-remedial groundwater monitoring will be conducted to provide confidence that copper, lead, and nickel does not migrate to groundwater at unacceptable levels. During implementation of the Selected Remedy, groundwater monitoring wells will be protected to the extent possible. Groundwater monitoring wells disturbed during excavation activities will be replaced following the excavation. As part of a long-term management plan, a groundwater monitoring plan will be prepared that will provide the requirements for monitoring including sampling frequency, locations of wells, action levels, and monitoring exit strategy.

Although sediment accumulation along and adjacent to the OU2 shoreline has not been observed, post-remedial sediment accumulation monitoring will be conducted in the offshore area to provide confidence that contaminated material remaining at the site does not eroding and migrating to the offshore area such that sediment accumulates in the intertidal area immediately east of Site 29 (the area most like to have sediment accumulation from eroding material from OU2, if any does occur). The long-term management plan will be prepared to provide the requirements for monitoring accumulating offshore sediment. This plan will identify the frequency of inspections and the area in which the inspections will take place.

DRMO Impact Area

Further action is not required to protect human health and the environment in the DRMO Impact Area, and this area can be used for unrestricted and unlimited use.

2.12.3 Expected Outcomes of Selected Remedies

The current and reasonably anticipated future plan is to continue to use Sites 6 and 29 for industrial purposes. Under current conditions, exposure to soil in the DRMO area and waste disposal area is limited to construction workers who may conduct excavation work at these sites. Current and reasonably anticipated future potential exposure pathways are for people working in buildings at the site or accessing the area for occupational activities or construction workers exposed to contaminants in surface and subsurface soil. The excavation and soil cover portion of the Selected Remedy for the waste disposal area eliminates potential risks to industrial workers and hypothetical recreational users, and the LUC portion of the Selected Remedy eliminates potential risks to hypothetical residential users. The excavation portion of the Selected Remedy for the DRMO area eliminates potential risks to industrial workers and hypothetical recreational users, and the LUC portion eliminates potential risks to industrial workers and hypothetical recreation users from exposure to soil under Building 298 and also eliminates potential risks to hypothetical residential users. Groundwater monitoring will provide confidence that copper, lead, and nickel in residual soil do not migrate to the offshore area at unacceptable levels, and sediment accumulation monitoring will provide confidence that contamination does not erode such that it accumulates in the offshore area.

Groundwater at the site is not used and is not expected to be used in the future, and the Selected Remedies will have no impact on current or future groundwater uses available at the site. There are no socio-economic, community revitalization, or economic impacts or benefits associated with implementation of the Selected Remedies. It is estimated that the RAOs for Sites 6 and 29 will be achieved within approximately 2 to 6 months of implementation of the remedies, assuming that the remedial action occurs concurrently at these sites. Tables 2-9 and 2-10 describe how the Selected Remedies mitigate risk and achieve RAOs.

TABLE 2-9. HOW SELECTED REMEDY FOR THE WASTE DISPOSAL AREA MITIGATES RISK AND ACHIEVES RAOS		
RISK	RAO	COMMENTS
Potential unacceptable risks to human health from exposure to contaminated material.	Prevent human exposure through ingestion, dust inhalation, and dermal contact to contaminated soil with COC concentrations that exceed cleanup levels.	Excavation of surface soil and debris within the proposed soil cover limits and the adjacent debris areas and construction of a soil cover will reduce risk to acceptable levels for current industrial workers and hypothetical recreational users. LUCs will restrict potential future residential use of the site.
Potential future unacceptable offshore risks to ecological receptors from erosion of contaminated material.	Protect the offshore environment from erosion of contaminated soil from the OU2 shoreline.	Implementation of LUCs to provide requirements to ensure that site features integral with the remedy are present to minimize erosion. Sediment accumulation monitoring will provide confidence that contamination is not eroding to the offshore area.

TABLE 2-10. HOW SELECTED REMEDY FOR THE DRMO AREA MITIGATES RISK AND ACHIEVES RAOS		
RISK	RAO	COMMENTS
Unacceptable risks to human health from exposure to contaminated material.	Prevent human exposure through ingestion, dust inhalation, and dermal contact to contaminated soil with COC concentrations that exceed cleanup levels.	Excavation of soil in the excavation areas will reduce risk to acceptable levels for occupational and construction workers and hypothetical recreational users. LUCs will restrict potential future residential use of the site.
Potential future unacceptable offshore risks to ecological receptors from erosion of contaminated soil.	Protect the offshore environment from erosion of contaminated soil from the OU2 shoreline.	Implementation of LUCs to provide requirements that site features integral with the remedy are present to minimize erosion. Sediment accumulation monitoring will provide confidence that contamination is not eroding to the offshore area.
Potential future unacceptable risks to ecological receptors and human health from groundwater migration.	Prevent unacceptable risk from future potential migration of contaminants from unsaturated zone soil to groundwater in the interim capped area.	Excavation in the capped area will extend to the top of the rock fragment fill layer or where contaminant concentrations are at acceptable industrial levels to remove contaminated soil in the interim capped area.

2.13 STATUTORY DETERMINATIONS

In accordance with the NCP, the Selected Remedies meet the following statutory determinations:

- **Protection of Human Health and the Environment** – The Selected Remedy for the waste disposal area is needed to prevent potential unacceptable risks based on current industrial land use (occupational and construction) and hypothetical future recreational and residential land uses. Excavation of surface soil and debris, construction of a soil cover over remaining wastes, and implementation of LUCs will prevent exposure to contamination in the waste disposal area. The Selected Remedy for the DRMO area is needed to prevent potential unacceptable risks based on current industrial land use (occupational and construction) and hypothetical future recreational and

residential land uses. Excavation of soil in the construction worker remediation areas (shown on Figure 2-5) will reduce contaminant concentrations to acceptable levels for current industrial land use and hypothetical future recreational land use in the DRMO area. LUCs will prevent future residential use and restrict access to residual contamination under Building 298. Further action is not required for the DRMO Impact Area to protect human health and the environment.

- **Compliance with ARARs** – The Selected Remedies for Sites 6 and 29 will attain all identified federal and state ARARs, as presented in Appendix E.
- **Cost-Effectiveness** – The Selected Remedies are the most cost-effective alternatives that are expected to cause the least disruption of current facility operations, with the greatest protection of human health and the environment. The costs are proportional to overall effectiveness by achieving an adequate amount of long-term effectiveness and permanence within a reasonable time frame. Detailed cost estimates for the Selected Remedies are presented in Appendix F.
- Utilization of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable – The Selected Remedies represent the maximum extent to which permanent solutions and alternative treatment technologies can be used in a practical manner at Sites 6 and 29. Based on the heterogeneous mixture of organic and inorganic COCs (PAHs, PCBs, antimony, copper, lead, and nickel) and their distributions across the site, the Navy concluded that it was impracticable to treat the COCs in a cost effective manner. Surface soil removal and soil cover installation in the waste disposal area and removal of contaminated soil to achieve concentrations protective of current industrial workers in the DRMO area provides the best balance of tradeoffs for long-term effectiveness and permanence with ease of implementation for reasonable cost.
- **Preference for Treatment as a Principal Element** – Treatment is not a principal element of the Selected Remedies at Sites 6 and 29 because there are no principal threat wastes at the site. The Selected Remedies may reduce the toxicity, mobility, or volume of contaminants through treatment depending on the requirements for transportation of the excavated material for off-yard disposal.
- **Five-Year Review Requirement** – Five-year site reviews are required for Sites 6 and 29 because contamination will remain in excess of levels that allow for unrestricted use and unlimited exposure and will be conducted to confirm that the remedy remains protective of human health and the environment. Five-year site reviews are not required for the DRMO Impact Area.

2.14 DOCUMENTATION OF SIGNIFICANT CHANGES

CERCLA Section 117(b) requires an explanation of significant changes from the Selected Remedies presented in the Proposed Plan that was published for public comment. The Navy in consultation with the USEPA determined that modifications to the Selected Remedies based on comments received during the public comment period were not required. Comments received during the public comment period are discussed in Section 3.0, Responsiveness Summary.

3.0 RESPONSIVENESS SUMMARY

3.1 STAKEHOLDER COMMENTS AND LEAD AGENCY RESPONSES

Based on the results of the public comment period no changes to the remedy, as originally identified in the Proposed Plan, were necessary or appropriate. Participants in the public meeting held August 10, 2011, included a community and RAB member and representatives of the Navy, USEPA, and MEDEP. One community group provided oral and written comments during the public comment period. Comments received during the public comment period are included in Appendix C. The community group indicated general support for the Proposed Remedy. One comment affected the public comment period on the proposed remedies and is summarized in Table 3-1. Other comments related to the nature and extent of contamination and risks from migration of contamination were addressed in the RI and FS Reports for OU2. The Navy will prepare an RD, remedial action work plan, construction completion report, LUC RD, and long-term management plan that will address comments made on the implementability of the Selected Remedies for Sites 6 and 29. In addition, five-year site reviews are required for Sites 6 and 29, and will be conducted to confirm that the remedies for these two sites remain protective of human health and the environment. Therefore, the five-year site reviews will address comments made on the long-term protectiveness of the remedies for Sites 6 and 29. The Navy responses to these comments are provided in Appendix C.

TABLE 3-1. SUMMARY OF COMMENTS FROM PUBLIC HEARING AND PUBLIC COMMENT PERIOD

COMMENT	RESPONSE
A community group requested an extension of the OU2 public comment period for additional time to review the OU2 pre-design investigation data.	The Navy extended the end of the OU2 public comment period from August 19 to September 19, 2011. A notice regarding the extension was placed in the September 1, 2011 newspapers and is included in Appendix B. Written comments were received on September 19, 2011 and are included in Appendix C.

3.2 TECHNICAL AND LEGAL ISSUES

No technical or legal issues associated with the OU2 ROD were identified.

Administrative Record Reference Table

DETAILED ADMINISTRATIVE RECORD REFERENCE TABLE

ITEM	REFERENCE PHRASE IN ROD	LOCATION IN ROD	LOCATION OF INFORMATION IN ADMINISTRATIVE RECORD
1	FCS environmental samples	Table 2-1	N00102.AR.001743 (OU2 Supplemental RI Report, Tetra Tech, March 2010)
2	RFI soil samples	Table 2-1	N00102.AR.001743 (OU2 Supplemental RI Report, Tetra Tech, March 2010)
3	Onshore ecological risk assessment	Table 2-1	N00102.AR.001743 (OU2 Supplemental RI Report, Tetra Tech, March 2010)
4	Interim corrective measures	Table 2-1	N00102.AR.001743 (OU2 Supplemental RI Report, Tetra Tech, March 2010)
5	RFI data gap investigation	Table 2-1	N00102.AR.001743 (OU2 Supplemental RI Report, Tetra Tech, March 2010)
6	1996 to 1997 groundwater monitoring	Table 2-1	N00102.AR.001743 (OU2 Supplemental RI Report, Tetra Tech, March 2010)
7	Contaminant fate and transport modeling	Table 2-1	N00102.AR.001743 (OU2 Supplemental RI Report, Tetra Tech, March 2010)
8	Field investigation at Site 29	Table 2-1	N00102.AR.001743 (OU2 Supplemental RI Report, Tetra Tech, March 2010)
9	Emergency shoreline stabilization removal actions	Table 2-1	N00102.AR.001743 (OU2 Supplemental RI Report, Tetra Tech, March 2010)
10	Revised OU2 Risk Assessment	Table 2-1	N00102.AR.000923/N00102.AR.000924 (Revised OU2 Risk Assessment, Tetra Tech, November 2000)
11	Building 298 trenching	Table 2-1	N00102.AR.001743 (OU2 Supplemental RI Report, Tetra Tech, March 2010)
12	Soil washing treatability study	Table 2-1	N00102.AR.001743 (OU2 Supplemental RI Report, Tetra Tech, March 2010) and N00102.AR.002554 (OU2 FS Report, Tetra Tech, April 2011)
14	OU2 Additional Investigation	Table 2-1	N00102.AR.001743 (OU2 Supplemental RI Report, Tetra Tech, March 2010)
15	DRMO Impact Area EE/CA and Action Memorandum	Table 2-1	N00102.AR.001351 (Action Memorandum for Non-Time Critical Removal Action for DRMO Impact Area, Navy, November 2009)
16	Supplemental RI Report	Table 2-1	N00102.AR.001743 (OU2 Supplemental RI Report, Tetra Tech, March 2010)
17	Non-time critical removal action	Table 2-1	N00102.AR.001746 (Removal Action Work Plan for DRMO Impact Area, Shaw, May 2010)
18	FS and cleanup alternatives	Table 2-1	N00102.AR.002554 (OU2 FS Report, Tetra Tech, April 2011)
19	Land uses and resources	Section 2.6	N00102.AR.001743 (OU2 Supplemental RI Report, Tetra Tech, March 2010)
20	Human health risk	Section 2.7.1	N00102.AR.000923/N00102.AR.000924 (Revised OU2 Risk Assessment, Tetra Tech, November 2000) and N00102.AR.001743 (OU2 Supplemental RI Report, Tetra Tech, March 2010)
21	Ecological risk	Section 2.7.2	N00102.AR.001743 (OU2 Supplemental RI Report, Tetra Tech, March 2010)

DETAILED ADMINISTRATIVE RECORD REFERENCE TABLE

ITEM	REFERENCE PHRASE IN ROD	LOCATION IN ROD	LOCATION OF INFORMATION IN ADMINISTRATIVE RECORD
22	Remedial action objectives	Section 2.8	N00102.AR.002554 (OU2 FS Report, Tetra Tech, April 2011)
23	Preliminary technology/screening	Section 2.9	N00102.AR.002554 (OU2 FS Report, Tetra Tech, April 2011)
24	Remedial alternatives	Section 2.9	N00102.AR.002554 (OU2 FS Report, Tetra Tech, April 2011)
25	Nine CERCLA evaluation criteria	Section 2.10	N00102.AR.002554 (OU2 FS Report, Tetra Tech, April 2011)
26	Chemical-, location-, and action-specific ARARs	Section 2.10	N00102.AR.002554 (OU2 FS Report, Tetra Tech, April 2011)
27	Public meeting	Section 3.1	The public meeting for the Proposed Plan for OU2 was held on August 10, 2011.

Appendix A
State of Maine Concurrence Letter

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PAUL R. LEPAGE
GOVERNOR

PATRICIA W. AHO
COMMISSIONER

September 29, 2011

James T. Owens, III
Director, Office of Site Remediation & Restoration EPA New England, Region I
5 Post Office Sq. Suite 100
Mail Code OSRR07-5
Boston, MA 02109-3912

Re: Record of Decision for Operable Unit 2
Portsmouth Naval Shipyard, Kittery, Maine

Dear Mr. Owens:

The Maine Department of Environmental Protection (MEDEP) has reviewed the Record of Decision – Operable Unit 2 – Site 6, Site 29, and DRMO Impact Area, Portsmouth Naval Shipyard, Kittery, Maine dated August 2011. The Record of Decision (ROD) summarizes the results from the Remedial Investigation, the Feasibility Study, the results of the soil removal action that was conducted to address unacceptable risks to human health. Further, the ROD documents the Navy's rationale for the selected decision at OU-2 of surface soil removal, soil cover, land use controls and monitoring at the Waste Disposal Area and soil removal, land use controls and monitoring at the Defense Reutilization and Marketing Office Storage Yard. MEDEP concurs with the selected decision for OU-2.

The State's concurrence of the selected decision, as described above, should not be construed as the State's concurrence with any conclusion of law or finding of fact, which may be set forth in the ROD or supporting documents for the site listed above. The State reserves any and all rights to challenge any such finding of fact or conclusion of law in any other context.

This concurrence is based on the State's understanding that the Navy will continue to solicit MEDEP's review and concurrence with the Remedial Design, Remedial Action oversight, Remedial Action report, Land Use Controls Remedial Design and Post-Remedial Operation, Maintenance and Monitoring Plan for OU2.

MEDEP looks forward to working with the Department of the Navy and Environmental Protection Agency to resolve the environmental issues remaining at the Portsmouth Naval Shipyard. If you have any questions or comments, please contact Iver McLeod at iver.j.mcleod@maine.gov or 207-287-8010.

Best regards,

Patricia W. Aho
Commissioner

pc: Iver McLeod – MEDEP
Linda Cole – US Navy
Matt Audet - EPA

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Appendix B
PRAP

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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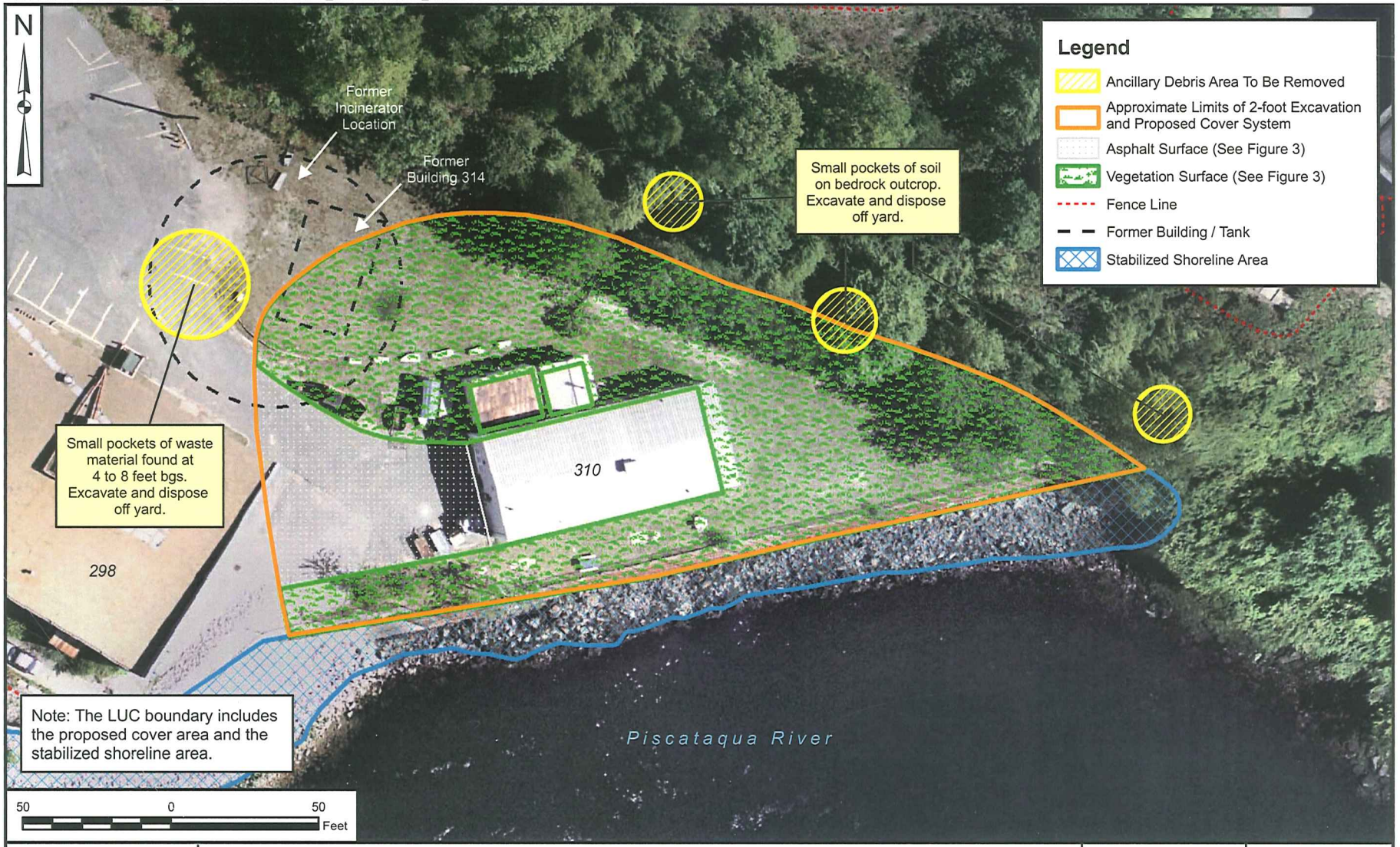

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REVISED BY —	DATE —		APPROVED BY — DATE —
SCALE AS NOTED			FIGURE NO. FIGURE 2 / REV 0

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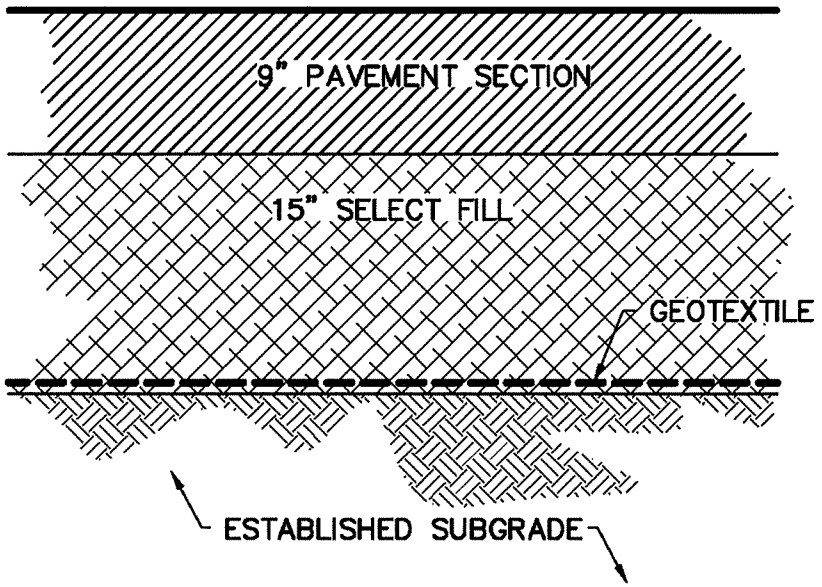

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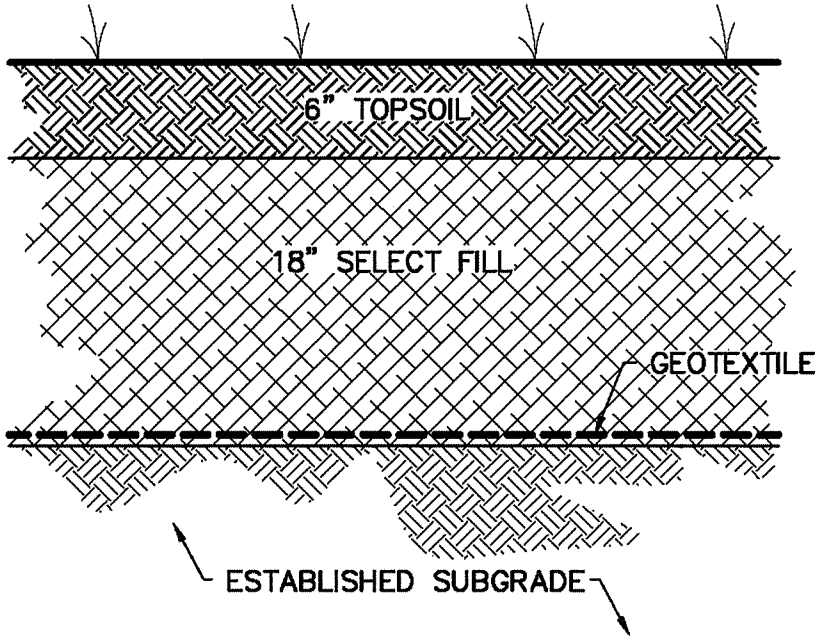

VEGETATIVE SECTION
NOT TO SCALE

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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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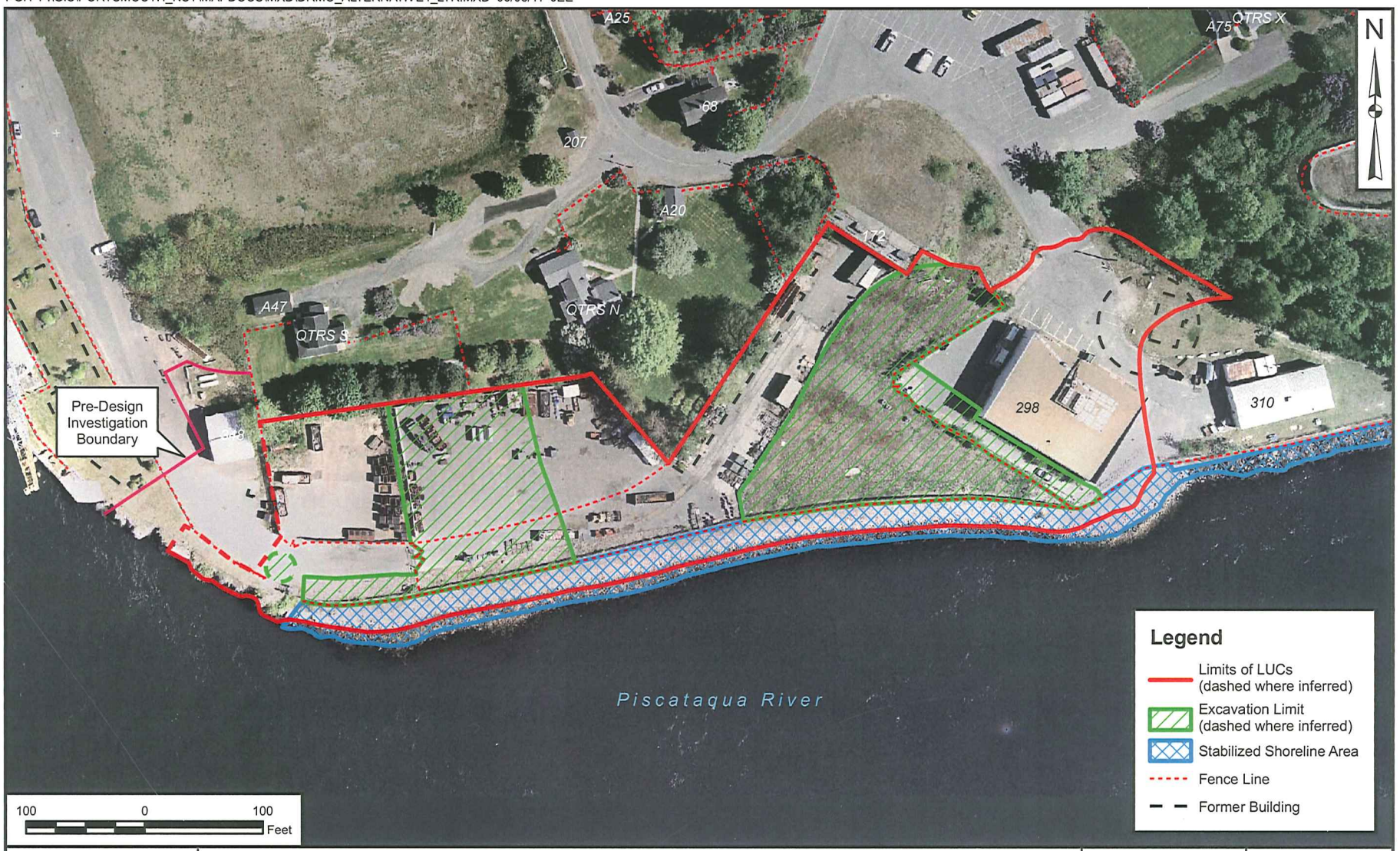

DRAWN BY: J. ENGLISH	DATE: 06/02/11	TETRA TECH	CONTRACT NUMBER: 00924 / CTO NUMBER: 444
CHECKED BY: J. SPEAKMAN	DATE: 06/03/11	DRMO AREA ALTERNATIVE DRMO-4 PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE	APPROVED BY: — / DATE: —
REVISED BY: —	DATE: —		APPROVED BY: — / DATE: —
SCALE: AS NOTED			FIGURE NO.: FIGURE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

and Bridget Rierson, also of Atlanta; sister-in-law Cate (Crowley) Horton and her husband, Stuart, of Bethany, Conn.; brother-in-law Patrick K. Crowley and his wife, Camille, of Portsmouth; sister-in-law Mary Crowley and her husband, Noel, of Melbourne, Fla.; and three great-nieces, myriad cousins and many friends.

She was predeceased by her parents, Daniel Stephen Connors and Rosemary (O'Donnell) Connors, of Pittsburgh.

WE REMEMBER: Denise was born Nov. 5, 1945, in Pittsburgh, where she spent her youth, graduating in 1963 from St. Lawrence O'Toole High School and in 1966 from St. Francis Hospital School of Nursing as a registered nurse. An avid scholar, Denise continued her studies at Duquesne University and Boston College, where she received master's degrees in both community health and psychiatric mental health nursing. In 1986, she earned a doctorate of sociology from Brandeis University with a focus on the sociology of health and illness.

she was a staff nurse at the Portsmouth Regional Hospital Behavioral Health Unit.

Denise was a member of the South Church Unitarian Universalist community in Portsmouth, where she served as an instructor in the young church program for a number of years. Eventually, she became a committed Buddhist and an active member of the Aryaloka Buddhist Center community in Newmarket, where she was ordained into the Triratna Buddhist Order in 2010.

SERVICES: A celebration of Denise's life will take place in August. If desired, donations may be made in Denise's memory to Amy's Treat (www.amystreat.org). Amy's Treat is an independent community organization dedicated to providing help to people undergoing treatment for cancer and their families. Amy's Treat coordinates with the professionals at the Seacoast Cancer Center in Dover, to provide whatever services, assistance and "treats" may help these patients and their families deal with one of life's most stressful situations.

with Rexnord in 1970. He was vice president of operations for Rexnord from 1973 to 1978. Mr. Taylor was elected president and chief operating officer in 1978, vice chairman and chief executive officer in January 1985, chairman and chief executive officer in November 1985, and following the acquisition of Rexnord by Banner Industries, chairman in 1987.

81 Providence St., Worcester, MA 01604; or North Hampton United Church of Christ, 295 Atlantic Ave., North Hampton, NH 03862. Private burial will be in the Little River Cemetery. Arrangements are by Remick & Gendron Funeral Home-Crematory, Hampton. For directions and an online guest book, visit www.RemickGendron.com.

City of Portsmouth, New Hampshire
Portsmouth Library Nana Wall System
Bid Proposal #03-12
INVITATION TO BID

Sealed bid proposals, plainly marked, 2011 Portsmouth Library Nana Wall System Project, Bid Proposal #03-12 on the outside of the mailing envelope as well as the sealed bid envelope, addressed to the Finance/Purchasing Department, City Hall, 1 Junkins Avenue, Portsmouth, New Hampshire, 03801, will be accepted until 10:00 a.m., August 9, 2011; at which time all bids will be publicly opened and read aloud. A mandatory pre-bid meeting will be held August 1, 2011 @ 2:00 p.m., at the Portsmouth Public Library, 175 Parrott Avenue, Portsmouth, NH. This project consists of installation of a collapsible glass wall system by Nana Wall at the entrance to the Portsmouth Library in Portsmouth, NH. Specifically, the work entails the installation of a glass panel system, a structural header with cladding, top and bottom guide tracks, and relocation of exterior electrical lights. Specifications may be obtained from the City's web site: www.cityofportsmouth.com. Questions may be addressed to Purchasing Coordinator/Finance/Purchasing Department on the third floor at the above address, or by calling the Purchasing Coordinator at 603-610-7227. Addenda to this bid document, if any, including written answers to questions, will be posted on the City of Portsmouth website under the project heading. Work may begin in accordance with the Notice to Proceed with work completed within 120 days once commenced. Liquidated damages shall be assessed at $100.00 per day. Bidders must determine the quantities of work required and the conditions under which the work will be performed. The City of Portsmouth reserves the right to reject any or all bids, to waive technical or legal deficiencies, to re-bid, and to accept any bid that it may deem to be in the best interest of the City. Each Bidder shall furnish a bid security in the amount of ten percent (10%) of the bid. The Bid Security may be in the form of a certified check drawn upon a bank within the State of New Hampshire or a bid bond executed by a surety company authorized to do business in the State of New Hampshire, made payable to the City of Portsmouth, N.H.

#12517 1tP 7/21

Legal Notice
PUBLIC NOTICE

The Department of the Navy announces the availability for public comment of the Proposed Plan for cleanup of contamination at Operable Unit (OU) 2 at Portsmouth Naval Shipyard (PNS). This plan was prepared under the Comprehensive Environmental Response, Compensation and Liability Act (also known as Superfund). The public comment period for this Proposed Plan begins July 21, 2011 and ends August 19, 2011.

OU2 is located in the south-central portion of PNS along the Piscataqua River and includes Site 6 – the Defense Reutilization and Marketing Office (DRMO) Storage Yard, Site 29 – the Former Teepee Incinerator Site, and the DRMO Impact Area – Quarters S, N, and 68. Soil contamination at Site 6 resulted from past storage of lead battery cells, nickel-cadmium batteries, and plates that were stockpiled on uncovered pallets. Other materials reportedly stored at Site 6 included motors, typewriters, paper products, and scrap metal. The main activities that led to soil contamination at Site 29 were related to open burning, industrial incineration, and waste disposal. In the past, DRMO Storage Yard activities resulted in the contamination of soil within portions of the adjacent DRMO Impact Area. These impacted soils were excavated and disposed of off-site in 2010 as part of a Non-Time Critical Removal Action. With the removal of contaminated soil in the DRMO Impact Area, potentially unacceptable risks from exposure to soil in that part of OU2 were eliminated. Further action is not required to protect human health and the environment in the DRMO Impact Area. Past activities at OU2 resulted in contaminated soil at concentrations that could pose a potentially unacceptable risk to human health and the environment at Sites 6 and 29. Therefore, remedial action is required to address potential risks associated with these two sites.

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Community input is integral to the remedial action selection process. The public is encouraged to review the Proposed Plan for OU2 at the following Information Repositories during normal hours of operation:

Rice Public Library
8 Wentworth Street
Kittery, Maine 03904
207-439-1633

Portsmouth Public Library
175 Parrott Avenue
Portsmouth, New Hampshire 03801
603-427-1540

On August 10, 2011, the Navy will hold a public meeting at the Kittery Town Hall in Kittery, Maine, consisting of an informational session to be held from 6 to 8 pm where Navy personnel will be on hand to provide information and answer questions regarding the OU2 proposed cleanup. Following this informational session, the Navy will accept oral and written comments from the public from 8 to 8:30 pm. Written comments can also be submitted during the public comment period by mail or fax to the Navy contact listed below, and must be postmarked no later than August 19, 2011.

Ms. Danna Eddy, Public Affairs Office (Code PAO100)
Portsmouth Naval Shipyard, Portsmouth, NH 03804-5000
Telephone: 207-438-1140
Fax: 207-438-1266

#21344 1tP 7/21

Portsmouth Herald, July 21, 2011

nance to permit a permit a garage on lot which does not meet the setbacks as required in the Table of Dimensional Requirements. Property is located at Map 38, Lot 80, St. James Ave, Milton, NH.

The applications will be considered for acceptance at the meeting. If the applications are accepted and time permits, a Public Hearing will then follow. A copy of the applications and related materials are available at the Milton Land Use Office.

James Smith, Chairman
Zoning Board of Adjustment

17 Public Notice | 17 Public Notice | 17 Public Notice

PUBLIC NOTICE

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Ms. Danna Eddy, Public Affairs Office (Code PAO100)
Portsmouth Naval Shipyard, Portsmouth, NH 03804-5000
Telephone: 207-438-1140
Fax: 207-438-1266

Instruction | Instruction | Instruction

210 Job Training | 210 Job Training | 210 Job Training

NAPA AUTO PARTS 45 Hancock St. Rochester NH has positions available. Apply within.

Announcements

238 Dogs-Cats/Birds/Pets

BLACK SIAMESE LOST- Emmy's slender, with yellow eyes, wears a black electr collar. She's from Exeter library & Mill apartments area. If seen, call 603 686-4315 or 603 686-4922

292 Farm Tractors-Trailers

FARMALL CUB Tractor with 59" Woods mower, plows & grader/snow plow. Less than 1500 hours. Good condition- $1,750. Call 742-7527

Merchandise

310 Articles for Sale

315 LB WEIGHT set with bench. main bar stainless steel.all pro $125/offer 603-479-1644 ngramp@ metrocast.net

3 CORDS FIREWOOD, dried and cut August 2010. 6 foot in length, all hardwood. Buyer must pickup and load. $160.00 a cord. Also for sale a Truck cap, came off from Small Dodge pickup. $150.00. Call 603-767-5347 wapin2009@yahoo.com

310 Articles for Sale

A VARIETY OF nascar items that have never been out of original packages. items start at $5.00 to $20.00. Call 774-271-2187

BABY ITEMS: GENTLY used change table, bassinette, car seat and base, swing $100.00 603-834-0091

STERLING STAIR CHAIR lift, used very little, paid $2800, sell $500; recliner, brown, green & tan print, $50; 72 inch pine trestle table, good condition, $75. Call 692-2147

318 Barn - Garage - Yard Sale

BERWICK 07/23/2011 8AM-1PM Moving to FL sale! includes: Furniture, Trading Card sets, yard stuff etc. 142 Pine Hill Road

DOVER JULY 23 8am - Noon MULTI Family Yard Sale at The Paddock Tennis Court off of Mast Road

318 Barn - Garage - Yard Sale

DURHAM - - Friday 7/22, Saturday 7/23, Sunday 7/24. 9am to 6pm each day. Furniture, tools, toys, DVDs, more. 4 Riverview Road, off of Route 4

Sale 8-3 1283 F Rd, Rte 7/30 & tools,fu

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FAMILY NOTICE

Shannon Paul

RINGGOLD, Va. — Shannon Lee Ann Kunze Paul was taken from us suddenly Friday, Aug. 26, 2011.

Shannon was born July 8, 1982, at Winchester Hospital, in Winchester, Mass. She spent most of her life in York, Maine. She worked for US Cellular in both New Hampshire and Virginia offices.

Shannon (momma chipmunk) touched many lives in her short life time and was loved by all. She is survived by her loving husband, Eric B. Paul (daddy chipmunk), and five wonderful children, Lucas Bryan, 8 years old, Tyson Stephen, 6 years old, Bradley Thomas, 3 years old, Alisha Noel, 2 years old, and Gabrielle Lynn, 8 months old; her mother, Martha M. Goulart Kunze; and she was preceded in death by her father, Stephen Paul Kunze. She is also survived by her sister, Samantha Kunze Dobbins, husband Shawn Dobbins, and son Russell; her sister, Sabrina Kunze Baker, husband Michael Baker, and daughter Kimmie; her mother-in-law, Dawn Gilliam Tilton and husband Craig Tilton; her father-in-law, Ronald Paul and wife Pam Paul; and her brother-in-law, TJ Paul and daughter Aaliyah.

Services will be held at the Mount Pleasant United Methodist Church on Route 29, Blairs, Va. Shannon's memorial in Maine will be held at the Living Waters Christian Church, at 197 Parker Farm Road, Buxton. Both services will be at 11 a.m. Saturday, Sept. 3.

In lieu of flowers, donations may be made to a memorial fund for her five children, and mailed to Eric Paul at 745 Ringgold Church Road, Ringgold, VA 24586. Make payable to: The Children of Shannon L.A. Paul Trust.

Wish heaven had a phone, so I could hear your voice again. I thought of you today but that's nothing new. I thought of you yesterday and days before that too. I think of you in silence and often speak your name. All I have are memories and pictures in a frame. Dad has you in his arms but I have you in my heart.

FAMILY NOTICE

Michael Guerette

FIRE ISLAND, N.Y. — Michael Guerette, 51, of Fire Island, died unexpectedly Friday, Aug. 12, 2011, while hiking on the Appalachian Trail in northern Franklin County, Maine.

Michael was born April 26, 1960, in Portsmouth, N.H., son of the late Paul Guerette and Annette (Guerette) Dozier. His father perished aboard the USS Thresher in 1963. Michael was a 1978 graduate of Portsmouth High School, where he was active in drama and choir. Michael was a beloved, year-round resident of Fire Island's Cherry Grove, where he coowned Garden Grove for 17 years and served as a volunteer firefighter. He was famous for his landscaping and singing talents and was an avid hiker.

Michael was predeceased by half-brother Wayne Dozier, and is survived by his stepfather, Richard Dozier of Portsmouth, N.H.; two brothers, Mark Guerette of Jersey City, N.J., and Thomas Guerette of Stratham, N.H.; nieces and nephews, Jessica Guerette of Sanford, Maine, Jason and Amanda Guerette of Jersey City, N.J., and Ryan Guerette of Stratham, N.H.; and several aunts (including godmother, Jacqueline Jacques of Lawrence, Mass.), uncles and cousins.

There will be a celebration of life for Michael from 2 to 4 p.m. Saturday, Sept. 17, 2011, at the Farrell Funeral Home, 684 State St, Portsmouth, N.H. In lieu of flowers, donations in Michael's memory may be sent to the Cherry Grove Fire Department Inc., P.O. Box 4173, Cherry Grove, NY 11782.

Katherine M. Abbott

HAMPTON — Katherine M. (Koop) Abbott, 99, of Hampton, formerly of Portsmouth, died Wednesday, Aug. 31, 2011, at the Oceanside Skilled Nursing and Rehabilitation in Hampton.

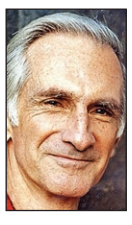
She was born April 1, 1912, in Lunstead, Germany, the daughter of the late Henry B. and Katherine M. (Kellmer) Koop.

Survivors include her son, Albert Abbott and his wife, Rita, of North Hampton; two granddaughters, Catherine and Lindsey Abbott; two great-grandchildren, Madison and Joshua Abbott; and several nieces and nephews.

Katherine was predeceased by her husband, Harold W. Abbott.

SERVICES: A funeral service will be held at 1 p.m. Friday, Sept. 2, at the J. Verne Wood Funeral Home – Buckminster Chapel, 84 Broad St., Portsmouth. Friends are invited. There will be no visiting hours. In lieu of flowers, memorial contributions may be made to Crotched Mountain, 1 Verney Drive, Greenfield, NH 03047. Visit www.jvwoodfuneralhome.com to sign an online guest book, send a private condolence and/or a sympathy card.

Charles M. Quinlan Jr.



PORTSMOUTH — Capt. Charles M. Quinlan Jr., 82, died Saturday, Aug. 27, 2011.

He was born June 17, 1929, in Highland Falls, N.Y., and was a longtime resident of Portsmouth.

He served as an aviator for nine years in the U.S. Air Force, and worked in the ferry trade of the British Virgin Islands and in the charter sailboat industry. He was a research adviser on the 1993 restoration of the USS Constitution. He managed the Shining Sea Foundation of East Boston, Mass., where he prepared for the construction of a clipper ship.

He is survived by his daughter, Elizabeth Gray of Eugene, Ore.; two granddaughters, Cassidy Elizabeth Schrey and Hannah Rose Schrey of Oregon; his sister, Diana Rugh of Fairfield, Iowa; nephew Charles Rugh of Alaska; and great-nephew Race Rugh of California.

In lieu of flowers, donations may be sent to the Portsmouth Athenaeum, 9 Market Square, Portsmouth, NH 03801.

Huntsman offers jobs proposal

Tax changes, trade plan in mix

BY STEVE PEOPLES
Associated Press

HUDSON — Republican presidential candidate Jon Huntsman on Wednesday called for sweeping tax changes and new trade agreements to help revitalize the nation's manufacturing sector and create jobs.

Struggling in the polls, the former Utah governor became the first active Republican contender to offer a detailed job-creation blueprint, timing it for the week before President Barack Obama and GOP rival Mitt Romney announce their own plans.

Huntsman called for eliminating taxes on capital gains and reducing the corporate tax rate from 35 percent to 25 percent, similar to pitches his rivals make while campaigning. His plan also drastically lowers personal income tax rates, while ending popular tax credits and deductions that affect the middle class, such as the mortgage interest deduction and child tax credit.

But Huntsman's plan was short on specifics. He acknowledged it would be difficult to implement and described his proposals as essentially the first step. "You've got to start with a negotiating position," he said, noting that there was no specific analysis for the plan's cost or how taxpayers of different incomes would be affected.

He also pushed for new trade deals with Japan, India and Taiwan, in addition to those proposed by the Obama administration with Colombia, Panama and South Korea. And he called for repealing Obama's health care overhaul, "dramatically" reining in the Environmental Protection Agency and reforming the Food and Drug Administration's "ridiculous approval process."

Huntsman described his proposals as common sense, "not radical or revolutionary," and used the event at Gilchrist Metal Fabricating to draw distinctions between himself, Obama and the GOP field.

"The president believes that we can tax and spend and regulate our way to prosperity. We cannot. We must compete our way to prosperity," Huntsman said, flanked by a massive machine and offering no proof to his assertions about Obama. "We need American entrepreneurs not only thinking of products like the iPhone or Segway; we need American workers building those products. It's time for 'Made in America' to mean something again."

The location of the announcement and emphasis on American manufacturing prompted critics to challenge Huntsman's record at the Huntsman family business. Huntsman Corp., a chemical company, employs far more workers overseas than in the United States.

Huntsman's campaign conceded that fact, but said the jobs plan would improve the business climate in this nation and help Huntsman Corp. and other businesses hire more American workers.

That did little to quiet Democratic criticism.

"It's ironic that Huntsman is pushing 'Made in America' so hard when 'Made in China' has made him millions," said Ty Matsdorf, spokesman for American Bridge, a political group allied with Democrats.

And the labor union group known as the American Jobs Alliance issued a statement Wednesday afternoon assailing Huntsman's trade proposals, with spokesman Curtis Ellis saying: "The fatally flawed free-trade deals which Jon Huntsman supports will destroy jobs in the U.S., not create them."

MAINE GOP MAY PUSH OWN REDISTRICTING PLAN

BY GLENN ADAMS
Associated Press

AUGUSTA, Maine — Even though a Democratic-backed plan to redraw Maine's congressional district line has won a bipartisan advisory panel's support, Republicans say they may use their legislative muscle to push through a more radical plan.

But a GOP leader said Wednesday he'd like to avoid that route, which would likely provoke a Democratic lawsuit, and expects the two sides will resume negotiations leading to a consensus plan before the Legislature meets Sept. 27 to take up the matter.

"We clearly don't want this to go to the courts," said Senate Majority Leader Jonathan Courtney, R-Springvale. "We don't think that would be good for anyone involved."

After the Redistricting Commission voted 8-7 on Tuesday to embrace the Democratic plan, Republicans on the panel raised the possibility of using their legislative majority to bypass a statutory requirement of a two-thirds majority vote needed to approve a final plan to redraw the line between Maine's two congressional districts.

Courtney said there are a number of examples in the past in which Democrats, then in the majority, got around two-thirds requirements by inserting language that effectively bypasses the rule.

"I don't see it going down this road," Courtney said, adding that Republicans are willing to negotiate further with the Democrats. He said that work would probably start after this weekend. Failure by the Legislature to adopt a plan would send the matter to the state Supreme Court.

The state Democratic Party issued a statement saying it was "surprising and disheartening" to hear Republicans talk about pushing their proposal through with only a majority vote. Democrats say they hope what they heard "was indeed just talk."

The Democrats' plan, which was adopted with the tiebreaking vote of the independent Reapportionment Commission chairman, leaves Maine's district line essentially intact; it leaves Cumberland, Knox, Lincoln, Sagadahoc, York and part of Kennebec counties in the 1st District.

The plan embraced by Republicans redraws the line from east-west to north-south and moves the hometown of Democratic U.S. Rep. Chellie Pingree, North Haven, out of the 1st District she represents into the 2nd.

Groups urge N.H. Senate to kill voter photo proposal

CONCORD (AP) — A coalition is urging the New Hampshire Senate to kill a bill that would require people to produce government-issued photo identification to vote in the state.

The League of Women Voters, AARP and New Hampshire City and Town Clerks Association outlined their objections to the bill at a news conference Wednesday. They said the bill will disenfranchise some voters while being difficult and costly to implement properly.

The bill would require voters without proper photo identification to cast a provisional ballot and be given 2½ days to produce a valid photo ID. The secretary of state could waive the photo ID requirement and the fee.

The Senate meets next Wednesday to consider overriding Gov. John Lynch's veto of the bill.

Two Maine judicial nominations announced

AUGUSTA, Maine (AP) — Maine Gov. Paul LePage is announcing two judicial nominations, which will face Senate confirmation votes on Sept. 27.

The governor seeks to elevate District Judge John O'Neil to the Superior Court bench, and to appoint Justice G. Arthur Brennan as an active retired justice of the Superior Court.

LePage said both nominees have distinguished records on the bench and were nominated on the basis of their qualifications and integrity, not politics.

O'Neil, a resident of Kennebunk, was nominated to the District Court by former Democratic Gov. John Baldacci in 2007.

Brennan, a resident of York, has served on the bench since 1982.

Palin plans return to Granite State

MANCHESTER (AP) — Former Alaska Gov. Sarah Palin is set to make another trip to New Hampshire.

Palin plans to visit Manchester on Monday.

WMUR-TV reported that she plans to hold an event at Veterans Park, but Mayor Ted Gatsas said organizers don't yet have the permits they need for the event.

Legal Notice
Notice of Intent to Abandon and to Discontinue Rail Service

Boston and Maine Corporation and Springfield Terminal Railway Company (collectively "B&M") hereby give notice that on or about September 5, 20 I 1, it intends to file with the Surface Transportation Board, Washington, DC 20423, a notice of exemption under 49 CFR 1152.50(d)(I) - Exempt Abandonments permitting the abandonment of and discontinuance of service of a 10.0 mile line of railroad between railroad milepost 0.00 to milepost 10.0, which traverses through United States Postal Service ZIP Codes: 03801, (Portsmouth, NH), 03840 (Greenland, NH), 03870 (Rye, NH), 03862 (North Hampton, NH), and 03842 (Hampton, NH) in Rockingham County, New Hampshire. The proceeding will be docketed as No. AB 32 (Sub No. 104) and AB 355 (Sub No. 40). The Board's Section of Environmental Analysis (SEA) will generally prepare an Environmental Assessment (EA), which will normally be available 25 days after the filing of the notice of exemption. Comments on environmental and energy matters should be filed no later than 15 days after the EA becomes available to the public and will be addressed in a Board decision. Interested persons may obtain a copy of the EA or make inquiries regarding environmental matters by writing to the Section of Environmental Analysis (SEA), Surface Transportation Board, Washington, DC 20423 or by calling that office at (202) 245-0296.

Appropriate offers of financial assistance to continue rail service can be filed with the Board. Requests for environmental conditions, public use conditions, or rail banking/trails use also can be filed with the Board. An original and 10 copies of any pleading that raises matters other than environmental issues (such as trails use, public use, and offers of financial assistance) must be filed directly with the Board's Section of Administration, Office of Proceedings, 395 E Street, SW., Washington, DC20423~001 [See 49 CFR I 104.1 (a) and 1104.3(a)], and one copy must be served on applicants' representative [See 49 CFR 1104.12(a)]. Questions regarding offers of financial assistance, public use or trails use may be directed to the Board's Office of Public Assistance, Governmental Affairs and Compliance at (866) 254-1792. Copies of any comments or requests for conditions should be served on the applicant's representative:

Robert B. Bums, Esq., Corporate Counsel
Boston & Maine Corporation, 1700 Iron Horse Park, North Billerica, MA 01862

#31725 1tP 9/1

Legal Notice
PUBLIC NOTICE

The Department of the Navy announces the extension of the public comment period on the Proposed Plan for cleanup of contamination at Operable Unit (OU) 2 at Portsmouth Naval Shipyard (PNS). This plan was prepared under the Comprehensive Environmental Response, Compensation and Liability Act (also known as Superfund). The public comment period for this Proposed Plan has been extended until September 19, 2011.

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Kittery, Maine 03904
207-439-1633

Portsmouth Public Library
175 Parrott Avenue
Portsmouth, New Hampshire 03801
603-427-1540

Written comments can be submitted during the public comment period by mail or fax to the Navy contact listed below, and must be postmarked no later than September 19, 2011.

Ms. Danna Eddy, Public Affairs Office (Code PAO100)
Portsmouth Naval Shipyard, Portsmouth, NH 03804-5000
Telephone: 207-438-1140
Fax: 207-438-1266

#21344 1tP 9/1

Place your ad online Anytime 24/7
www.fosters.com/placeanad
Or email fddads@fosters.com

Foster's Daily Democrat
Classifieds

1-866-414-7355
150 Venture Drive, Dover
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Thursday, September 1, 2011


Transportation

Real Estate


Employment


Merchandise


Pets

Personals

41 Lost-Found

LOST: yellow & grey cockatiel. Possibly last seen in southern Maine 603-608-8215 Reward

Employment

146 Help Wanted

CASHIER Full and part time nights & weekends. Apply in person at Heath's Mobile Mart, 1980 Woodbury Ave., Portsmouth.

Granite Steak & Grill
Now Accepting Applications for
LINE COOKS
KITCHEN SUPERVISORS
SERVERS
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Please apply in person at
11 Farmington Rd., Rochester, NH

FRAMERS WANTED Immediate opening. Liability insurance required. Call 603-659-4504.

146 Help Wanted

COOK: LOOKING FOR a part-time cook who can manage and oversee a function hall up to a capacity of 400. Send resume to: PO Box 1393, Rochester, NH 03866.

BILLING/AR ADMINISTRATOR:
Madison Resource Funding located in Portsmouth, NH is looking for an energetic, detail oriented team player with Billing & Collections experience. Excel skills and ability to multi-task is desired. Interested candidates should send resume to Sandi @ smacleod@4funding.com or fax 603.427.1089.

Stratham TIRE
Your First Choice for Tires & Service!
TAMWORTH, NH
- **MANAGER** - Qualified candidate will have automotive and commercial truck tire experience with excellent customer service skills. Experience in job/tire pricing, safety and crew management is a must.

Contact Denise Littlefield 603-679-2232 or hr@strathamtire.com

146 Help Wanted

Parking Attendant,
8 to 10 hours per week
to monitor and address traffic flow issues
during school arrival/dismissal to
enforce school parking procedures.
Please apply at schoolspring.com

CONCRETE FORM WORKERS
Experienced Preferred
40+ hours per week
Need valid drivers license
NORMAN VETTER POURED FOUNDATIONS
Rochester, NH
Office: 603-332-0354
email: NVI@metrocast.net

KITTERY SCHOOL DEPARTMENT
Vacancy
Educational Technician III Elementary Level
Must have 90 credits of approved study.
Hearing Impaired and Autism experience/ knowledge preferred.
Candidates submitting a cover letter, district application, resume, three current letters of reference and transcripts will be considered for this position.
Allyn Hutton
Superintendent of Schools
200 Rogers Road, Kittery, ME 03904
E.O.E.

17 Public Notice

17 Public Notice

PUBLIC NOTICE

The Department of the Navy announces the extension of the public comment period on the Proposed Plan for cleanup of contamination at Operable Unit (OU) 2 at Portsmouth Naval Shipyard (PNS). This plan was prepared under the Comprehensive Environmental Response, Compensation and Liability Act (also known as Superfund). The public comment period for this Proposed Plan has been extended until September 19, 2011.

OU2 is located in the south-central portion of PNS along the Piscataqua River and includes Site 6 - the Defense Reutilization and Marketing Office (DRMO) Storage Yard, Site 29 - the Former Teepee Incinerator Site, and the DRMO Impact Area - Quarters S, N, and 68. Soil contamination at Site 6 resulted from past storage of lead battery cells, nickel-cadmium batteries, and plates that were stockpiled on uncovered pallets. Other materials reportedly stored at Site 6 included motors, typewriters, paper products, and scrap metal. The main activities that led to soil contamination at Site 29 were related to open burning, industrial incineration, and waste disposal. In the past, DRMO Storage Yard activities resulted in the contamination of soil within portions of the adjacent DRMO Impact Area. These impacted soils were excavated and disposed of off-site in 2010 as part of a Non-Time Critical Removal Action. With the removal of contaminated soil in the DRMO Impact Area, potentially unacceptable risks from exposure to soil in that part of OU2 were eliminated. Further action is not required to protect human health and the environment in the DRMO Impact Area. Past activities at OU2 resulted in contaminated soil at concentrations that could pose a potentially unacceptable risk to human health and the environment at Sites 6 and 29. Therefore, remedial action is required to address potential risks associated with these two sites.

The types and concentrations of contaminants at Site 6 and in the western portion of Site 29 are similar; therefore, the areas were combined for development of cleanup alternatives as part of the DRMO area. The remainder of Site 29 was evaluated as the waste disposal area. Five alternatives were evaluated to address contamination at the DRMO area, and four alternatives were evaluated to address contamination at the waste disposal area. The Navy evaluated the effectiveness, implementability, and cost of these alternatives, and based on the results of this evaluation, the Navy's preferred method of addressing contamination at Sites 6 and 29 is surface soil removal and soil cover with land use controls (LUCs) and monitoring within the waste disposal area and excavation and off-yard disposal of soil associated with potentially unacceptable risk based on industrial site use, LUCs and monitoring to address contamination within the DRMO area.

Community input is integral to the remedial action selection process. The public is encouraged to review the Proposed Plan for OU2 at the following Information Repositories during normal hours of operation:

Rice Public Library
8 Wentworth Street
Kittery, Maine 03904
207-439-1633

Portsmouth Public Library
175 Parrott Avenue
Portsmouth, New Hampshire 03801
603-427-1540

Written comments can be submitted during the public comment period by mail or fax to the Navy contact listed below, and must be postmarked no later than September 19, 2011.

Ms. Danna Eddy, Public Affairs Office (Code PAO100)
Portsmouth Naval Shipyard, Portsmouth, NH 03804-5000
Telephone: 207-438-1140
Fax: 207-438-1266

Employment

146 Help Wanted

ELECTRICIAN southeastern NH. Residential wiring. Send resume with copy of drivers license to P.O. 1765, Rochester, NH 03867

Nurse, LNA's, Part-Time
Needed for home cases. Nurse with pediatric experience M,T 7:15a-5:15pm near Rochester. Part Time for Dover area, per diem home visits.
LNA's 1) Durham
M,T,W,F3:15-6:30pm,
Th til 8:30pm
2) North Hampton
M,T,W,F 10am-2pm
Benda HomeCare Solutions
Apply at www.BendaHomeCare.com

RIDEAU'S FLOORING is growing again. Looking for experienced linoleum person, must have 10 years experience and insurance 603-235-0470

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Madison Resource Funding is currently looking to expand our sales team with energetic people who love to do outbound phone sales. Excellent benefit package including salary, commission, medical, dental & 401K. Ideal candidate should email resume to:
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TOWN FAIR TIRE CENTER is looking for tire technicians part time positions - 25-30 hours. Experience preferred. Apply in person at 25 Fox Run Rd, Newington or call 603-430-8484

152 Medical-Dental-Nursing

AIDES NEEDED for assisted care facility. Weekend hours. Will train. Please call 603-755-2354

Farm-Livestock

238 Dogs-Cats/Birds/Pets

AKC ENGLIGH BULL DOG pups, 1 male, 2 females. 8 weeks old. Hand raised. Socialized and adorable. All shots. $2000. Maine license #V02274FR 207-324-7558 or 207-459-0567

17 Public Notice

Farm-Livestock

238 Dogs-Cats/Birds/Pets

AKC REGISTERED Brittany pups, males & females. Both parents are great grouse & woodcock dogs, on site. Tails docked, dew claws, 1st shots. Ready to go. $600. 207-612-6362

Merchandise

310 Articles for Sale

5000 watt Power Mate generator with a 6250 power surge, 10hp, $475. Tahoe 7000 watt portable diesel generator, electric start, new list for $6500, sell for $3000. package deal - assorted riding lawn tractors, engines, snowblowers & more for $1000. Some run. Tahoe gas powered water/trash pump with Honda engine lists for $990, sell $700. (603)664-7675

GAMING COMPUTER, Geforce GTX 460, 6 G ram, quad core AMD 2.9 GHZ, with gaming keyboard & 20 inch Samsung LCD. $550. 740-5638 leave message

GENERAC GENERATOR FOR SALE $600.00. MEGAFORCE 6500 kw Portable Generator. Features: 120/240 Volt, 30 Amp locking receptacle, 120 Volt 30 Amp locking receptacle, 120 Volt 20 Amp GFCI receptacle. Low Oil Shutdown. Seven gallon overhead fuel tank. Call 603.875.5539 frankw@metrocast.net

JAZZY ELECTRIC WHEELCHAIR. Like new only used for doctors visits. Brand new battery and serviced recently.
All manuals included. $1750 or best reasonable offer. 603-743-5882 bigkatfan@comcast.net

LOCKSMITH EQUIPMENT for sale: tools & supplies. Ideal for mobile start up business. 603-624-2424

318 Barn - Garage - Yard Sale

"202" FLEA MARKET, Rt. 202, Lebanon, ME Open every Sat. & Sun. 8 to 4 & Mon., Sept. 5. Set up 6 a.m. on. 207-457-1459.

East Rochester, 51 Autumn St., Saturday, 9/3 & Sunday, 9/4, 9-2 Clothing, luggage, gates avon collectibles, etc.

East Rochester: 8 Grove St. Sat. 9/3, 8 to 4. Tools, jewelry, plus size clothes, old things, some junk, many dollar items, woodstove, lawnmower. All cheap!

EPPING - Sept 4-5, 8 to 5, large Yard Sale - Arians snow thrower, Hummels, Womens clothing, Wood burning, tools, sporting goods, jewelry, crafts.. much more ! Labor Day Sale 153 Old Hedding Rd #37

314 Auctions

Real Estate Foreclosure Auction 11-214
Mixed-Use Retail Building - (57) Unit Storage Facility - 3.60+/- Acres
146 Emery Mills Rd. (Rte. 109)
Shapleigh, ME
Wednesday, September 21, 2011 at 10AM

Real Estate: Consists of a 3.6± acre parcel with 360± ft along Rt. 109. The level parcel has paved parking, excellent visibility and access to the street and is located .25 miles from Mousam Lake. Improving the site is 1985 multi-use wood-frame building containing 4,184± sf of GBA and is designed with (2) retail suites. The larger suite (2,756± sf) has an open retail area, office, kitchen, restroom, storage area, gas FHA and central AC. The smaller suite (868± sf) has an open retail area, storage room, restroom, and gas FHA. The 2003 metal-frame self-storage building contains 57 units in 7,800± sf. There are (12) 5x10, (12) 10x10, (18) 10x15, (12) 10x20, and (3) 10x30 storage units. Reference the Town of Shapleigh Tax Map 018, Lot 028.

Preview:
Wednesday, September 7, 2011 from 10-11AM

Terms: A **$10,000** deposit (nonrefundable as to the highest bidder) in CASH or CERTIFIED U.S. FUNDS, made payable to the Keenan Auction Company (deposited with the Auctioneer as a qualification to bid), increased to 10% of purchase price within 5 business days of the public sale, with balance due and payable within **30 days** from date of auction. For a Property Information Package containing legal and bidding documents, visit KeenanAuction.com or contact Auctioneer's office at (207) 885-5100 and request Auction #11-214. Richard J. Keenan #236. Our 39th Year and 5,815th Auction.

Keenan Auction Company
One Runway Rd.
So. Portland, ME 04106
207-885-5100
info@keenanauction.com

Rentals

318 Barn - Garage - Yard Sale

LEE 9/3-9/5 8:00-4:00 No early birds please Cybex Arc trainer, Kimball spinet piano, bedroom set with 2 twin beds, foosball table, couches,chairs, salmon falls pottery, books, clothes, so much more 31 James Farm

NEW DURHAM, rain or shine. 158 Old Bay Rd. Fri & Sat. 8 to 4. Cool stuff for everyone!

SOMERSWORTH 9/3/11 8 am Household items, etc. 56 Victoria Drive

370 Firewood

A1 QUALITY FIRE WOOD Green $225 cord seasoned blend $250 and 1 year old dry $290. Big truck load discount 603-978-5012

Green or seasoned $200 per cord and up. Buyer of standing timber. Tom Tremblay 859-3888

370 Firewood

GREEN & SEASONED FIREWOOD for sale. $200 to $275 per cord. Log length also available. Call for delivery Burkes Tree Service (603)332-4319

PJ'S QUALITY FIREWOOD green & dry. Also campers firewood available. 603-534-7382

SEASONED FIREWOOD $275 a cord. We deliver anywhere. Call 603-817-7270.

Real Estate

528 Houses for Sale

BROOKFIELD
Lease with option to buy
Brookfield, 2006 cape, 2+ acres, 3 bedroom, 2 bath, oversized 2-car garage, full walk-out basement. $1500 month or $218,777
(603) 393-7227

556 Mobile Homes

Showcase Home
Colonial Village, best lot in park, classy and stylish kitchen, master suite is awesome. What a Home!
$46,900
Seacoast Mobile Home Brokers
692-7300

Barrington Estates
A Family Community
Lots Available For Your New Home
Brand new 28x51 with 3 bedrooms, 2 baths, and storage shed
~~$107,800~~ **$98,500**
Brand new 28x48 with 2 bedrooms, 2 baths, and storage shed
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Nicely maintained 3-bdrm., 1-1/2 bath home on a corner lot. Mature plantings and side deck for summer enjoyment.
$40,000
Toy's Manufactured Housing Inc.
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for more information.
www.toysmanufacturedhousing.com

314 Auctions

Rentals

602 Apartments - Furnished

ALL UTILITIES included from $150-$225/week. HiVu Motor Inn, free internet, (603)332-1230.

604 Apartments - Unfurnished

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ABOVE THE REST!
PARTRIDGE GREEN
ROCHESTER'S FINEST COMMUNITY
An attractive combination of quality and value.
Studio, 1 & 2 bedroom units with balconies.
Low energy cost.
Laundry on site.
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Come in for a visit!
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Mon,Tues & Fri 10 to 4:30 & Thurs. from 10 to 5:30

ACTON 3 BEDROOM 2 bath, mobile on own land, Excellent location. $950 + (207) 698-5370

AFFORDABLE QUALITY large 2 bedroom in nice community. $815 Rochester. Call 332-8852

BERWICK 1 bedroom, Newly renovated. Great location.$625/month. No pets (207) 698-5370

DOVER 1 & 2 bedrooms $775-$875 heat & hot water included. Call 603-742-8282

DOVER 2-3 Bedroom $1050 Energy Star! W&D hookups. Potential for Free 1st month rent! 742-5300

DOVER FAIRFIELD GARDENS
- ✔ 1 & 2 Bedroom Apartments
- ✔ 1 bedroom from $665
- ✔ 2 bedrooms from $715
- ✔ Wall to Wall Carpeting
- ✔ Pool, Tennis Courts
- ✔ Laundry Facilities
- ✔ Hot water included

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603-743-4141

DOVER
FLORAL GARDENS
OFF OAK STREET
2 bedroom
Gas heat included. No pets.
$685-$740 per month
McQuade Realty
603-743-3400

DOVER
OAK TERRACE TOWNHOUSE
Off Oak ST
2 blocks south of hospital
2 bedroom, 1 1/2 baths.
No pets.
$850-$875/month
McQuade Realty
603-743-3400

604 Apartments - Unfurnished

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The Meadows At Dover
New Residents Special
1 bedroom @ $665
2 bedroom from $715
Loaded with amenities
~On Site Laundromat~
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EAST ROCHESTER 1 & 2 bedroom, No pets. $600 & $750 plus security. 332-4007, 8-5

FARMINGTON:2&3 bedrooms $800 & $900. Hookups. Yard, No smoking/pets 859-6243

GONIC, 1 bedroom, bottom floor of house. Clean and quiet. Ideal for single person or elderly. $650 month includes hot water & parking. No smoke, small pet possible. 781-6484 or 942-5169

LEE CIRCLE & BARRINGTON 1 & 2 bedroom. Heat & hot water, laundry. Rent negotiable. 603-661-5284

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2 Bedroom & Studio Apartments
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Many amenities.
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Attractive & Convenient Apartment Home
No Lease Required
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Heat/Hot Water Included
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Newmarket
2 bedroom apartments available starting at $900 per month including hot water. Check out our website at **www.cheneyco.com** or call for current listings at **603 659-2303**

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ROCHESTER 2 BEDROOM, 2nd floor, 3-season porch, No pets. $185/week + security & utilities. 603-781-4847

ROCHESTER 2 bedroom, hookups. starting @ $895 heat & hot water included 742.5300

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ROCHESTER 3 bedroom duplex, yard, $950 1st & security. Ready 10/1. 603-833-0938

ROCHESTER. Clean Quiet 2 bedroom. Move in special. Section 8 okay Call 603-661-8435.

ROCHESTER
Country Setting
So/Field Apartments
1 & 2 bedroom units.
Heat included.
Starting at $675
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ROCHESTER In-town efficiency, heat and hot water included, $120 a week. (603) 332-1240

ROCHESTER large 3 bedroom apartments. On site laundry, off street parking. $1150+ security & utilities, no pets. 781-4847.

ROCHESTER Large, clean, updated 1 bedroom, parking, storage, sun porch, hookups, $695. No dogs. (603) 750-5000

ROCHESTER New 3 bedroom, 3 bath 2000+ sq. ft. townhomes with 2 car garage. $1495+ Energy star! 742-5300

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Area's largest apartments,
laundry on each floor
Hot water included.
1 bedroom - $600
2 bedroom -
Starting at $675-$775
Daily 10am-5pm
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Somersworth
One bedroom first floor, heat and hot water included $775.00.
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www.purcellmanagement.com

STRAFFORD 2nd floor 2 bedroom apartment, deck, washer/dryer, refrigerator, range, heat & hot water included. No pets, no smoking. $875 a month. 603-664-6910

WANTED APARTMENT MANAGER
Live-in preferred or Rochester resident. 24 units, 1 building. Experience required. Weekly rent collection, light to heavy maintenance. Compensation based on experience. Call **603-566-5566**

622 Duplexes - Multiplexes

MADBURY 2+ bedrooms, $1400 monthly heat included. Newly renovated. 749-0033

636 Houses - Unfurnished

BARRINGTON 4 bedroom ranch log home, on 6.75 acres on cul-de-sac, fenced yard, finished basement, fireplace. $1500+ utilities & deposit. Call 603-790-8017

BROOKFIELD
Lease with option to buy
Brookfield, 2006 cape, 2+ acres, 3 bedroom, 2 bath, oversized 2-car garage, full walk-out basement. $1500 month or $218,777
(603) 393-7227

NEW DURHAM 2 bedroom ranch, yard, shed, clean, no pets. $950 a month, 603-817-0831.

ROCHESTER, 4 bedrooms, 2 baths, nice family neighborhood. No pets $1200 + utilities. 603-726-1135

684 Rooms - Furnished

LARGE ROOMS, air, full kitchens, utilities included. Affordable, clean & quiet. Laundry on site. Strafford Inn / Rochester Residence Inn Call 603-755-3411.

682 Rooms For Rent

ROCHESTER room for rent, $135 per week plus utilities. 332-1075.

697 Winter Rental

BARRINGTON Lake front Mendum Pond. Cozy 2 bedroom cottage. Easy to heat. Available now thru June 2012. $950 a month plus utilities. (603)370-0142

Services-Repairs

784 Flooring

RIDEAU'S FLOORING
HUGE INVENTORY AT STOCK PRICES. LINOLEUM, TILE, RESIDENTIAL AS WELL AS COMMERCIAL, CARPETS, & LAMINATE FLOORING
WE HAVE IT IN STOCK RIGHT NOW. CALL OR STOP BY
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603-235-0470
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824 Loam - Sod - Topsoil

***BARK MULCH**
7 Varieties,
***SCREENED LOAM SPECIAL $18/YD**
3/4" screened
***Stone & Gravel**
All Available for pick up/delivery
Call 603-742-0463
Mon.-Fri. 7-4 & Sat. 7-12
Closed Sundays
Bob Sherwood Landscape

SCREENED LOAM, 10 yard minimum, $14.75/yard, other products available. 207-252-1191.

833 Odd Jobs

GENERAL help, house, attic, yard, errands, and small truck for hauling, I am a mother & know how to help. Call me at 603-969-3906.

851 Roofing

D&K ROOFING Insured, free estimates. Serving NH & Southern ME. 603-509-0741

J.A.R. ROOFING Replacement Windows & Vinyl Siding & Repairs. Call 603-740-4250.

MIKE'S ROOFING PROFESSIONALS. Asphalt, rubber & metal roofing, quality work, reliable, affordable, fully insured. 603-312-8305

Sealed Tight Roofing Repairs. If you have a leak, let us take a peak. Insured. 603-833-1231

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1975 TRIUMPH SPITFIRE. 2 door convertible, 4 cylinder, 4 speed with overdrive, yellow. Good condition. $5,999 Call 603-832-4897

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Transportation

907 Autos for Sale

1987 Mercedes 420SEL 4 door,1 owner, Navy, 8 cylinder gas, good condition, new tires, $3,000 Call (603)664-9923

1990 BUICK RIVIERA COUPE FL car, loaded, V6, very good condition. $3500 or best offer. Call (603)664-7675

1996 DODGE CARAVAN SE. Owner TLC shows! New struts optional. All maintenance receipts. Many new parts. $1450 (207)676-2270 evenings

1998 FORD Windstar GL, very clean, well maintained, auto., power, must see and drive, $1950, 603-380-4917.

1998 SATURN SL2, one owner, 5 speed, loaded, sticker ready. $1695. Cell 603-918-9321.

2002 TOYOTA SIENNA LE van, 5 door, automatic V-6, dual heat & air condition, bucket seats, lots of extras, low miles, great shape. Needs nothing. Asking $7995. 603-969-5185 in Dover, NH

2004 CUSTOM 1200 Harley Davidson, loaded, mint condition, all chrome, new tires. Book value $6900. $4000/best offer. 8,000 miles. Call 207-351-7429

927 Pickups

2003 CHEVY Silverado 4X4 pickup, extended cab, Duramax Diesel with Alison transmission, oil change every 4k miles with synthetic oil, side step ups, tow package, fold back rear cover, 8' Fisher plow, well maintained, new Michelin tires. Will take plow truck as partial trade, must be inspectable. No junk. $17,900. 603-664-6941

944 Wanted-Automotive

1 ALL UNWANTED Cars & Trucks. Highest Price Paid. Free Towing. Call Cass Towing 692-4884.

HIGHEST PRICES PAID
for all complete Junk or Unwanted Cars
American Used Auto Parts
603-817-7489

PAYING $325 AND UP for Junk Autos. Free Pick Up. Call Jim today at 603-556-1034.

Recreational

985 Canoes-Kayaks

1 WILDERNESS PUNGO kayak, 10', $400. excellent condition. Call (603)742-3036 after 5pm

8FT JOHN BOAT with 2hp Evinrude outboard oars and cushions great condition! $450.00 or best offer. 603-479-1614 ngramp@metrocast.net

989 Motorcycles

2008 ELECTRA GLIDE Classic, 8400 miles, cruise, alarm, white pear/silver. $14,900 or best offer. 603-767-3975

Appendix C
Comments Received During the Public Comment Period and Navy Responses

RE: Proposed Plan for Operable Unit 2

Portsmouth Naval Shipyard

Kittery, Maine

PUBLIC HEARING, held on August 10, 2011, at the Kittery Town Hall, 200 Rogers Road, Kittery, Maine, commencing at 8:00 p.m., before Camille M. Palladino-Duffy, Court Reporter and Notary Public in and for the State of New Hampshire.

PUBLIC HEARING

AUGUST 10, 2011

MS. COLE: Good evening. My name is Linda Cole. I am the remedial project manager for NAVFAC MID ATLANTIC, and I would like to invite -- welcome you all here to our public meeting this evening on the remedial action for Operable Unit 2 at the Portsmouth Naval Shipyard.

At this particular time we will be taking oral and/or written comments. The meeting will -- we will be here until 8:30, at which time we will close the oral comment period. If you have written comments, written comments will be accepted also until August 19th. They have to be postmarked or faxed to the Public Affairs Office by the 19th, and to receive written comments.

In the record of decision, which will follow our meeting after we have accepted comments from the public, we will prepare a responsiveness summary to the significant comments we receive, and we appreciate your time.

And I'd like to open up the meeting by asking if anybody has any comments that they'd like to give us right now.

(Whereupon a Pause in proceedings.)

MS. COLE: Okay. Mr. Bogen, if you'd like to take the podium so that our stenographer can make sure that she gets your comments.

MR. BOGEN: Okay.

MS. COLE: And if you wouldn't mind, would you please state your name, spell it, and say what organization you are with, sir? Thank you.

MR. BOGEN: Yes. My name is Doug Bogen. That's B-O-G-E-N. I live in Barrington, New Hampshire. I am the executive director of Seacoast Anti-Pollution League, which I'm the coordinator for the tag grant for this program.

I am also the community co-chair of the Restoration Advisory Board, although, of course, my comments here are only as the SAPL director. I can't speak for the Board, of course, but, anyway, what I want to do is

just make some general comments and then our consultant, Carolyn Lepage, will go into a little more detail with some of our concerns and general comments.

Generally, as I've stated in many other meetings, I have a concern, my organization has a concern over the, you know, the big picture, you know, how are things going to look 10, 20, 30 years down the road. And I tend to think in terms of, you know, generations as opposed to, you know, 10 years or such.

And we are concerned about the long-term impact of the proposed plan. Again, Carolyn will go into more details, but we are concerned that some of the remedies may not really do the job as far as expected or potential changes to the local environment.

And I'm speaking mainly, in this case, at the OU2 of changes to the water environment, and also, you know, storm impacts and such in the future as being exacerbated by climate change and also sea

level rise.

And so we are concerned with, you know, given the location of the site, that it is so close to the water and it is a very dynamic situation. As we've heard, sediment doesn't build up, things tend to get carried away. There's been a lot of erosion in the past. There's been some challenges with the, you know, keeping the shoreline where it is. And I expect that those challenges may increase in the coming decades. So we are concerned, generally, how that will be resolved.

And, also, again from an environmental perspective, we are concerned about the long-term outlook of wanting to remove waste from a sensitive area, again, being Portsmouth Harbor, the Piscataqua estuary, and the need, even though it may not meet the regulatory requirements, the laws, the rules, we would like to see the maximum reduction of contamination from a site that is relatively precarious.

We realize that when you move it out

of one place, you've got to put it somewhere else. It doesn't just go away but, obviously, there are better places to be storing this than on the edge of the Piscataqua River and the Atlantic ocean, the gulf of Maine.

So, generally that, my point is that, our general principal is that we want to get as much waste as possible out of harm's way, if you will, away from the river.

So we are very encouraged, certainly, that this plan does make significant actual removal as opposed to just isolation of the waste. I often, you know, we all talk about clean up and, as we know in some of the other sites, like the Jamaica On-land fill, there's no physical clean up, it's more waste isolation.

In this case, we are seeing some very significant clean up in the sense of moving it off site, but we would like to see more of the waste removed, if possible. But that is certainly a good thing to be seeing

that moving forward. We just want to see more of it.

That's pretty much what I wanted to raise. I do want to make one point, though, about this event itself. I was concerned that, perhaps, being summer and having other things, distractions and all, I didn't happen to open the document that, the draft, and didn't note that the announcement of the public meeting was in the draft, even though I should probably know better because I've been through this process before.

But I expect that other people probably had the same problem that, I guess, what I'd say is that it would have been helpful if the notice of the hearing of this event tonight was in the e-mail message that came to me, as opposed to in the document. There wasn't any indication that that information was in the document. And I suspect that other people, perhaps, other members of the RAB had the same problem I did.

Fortunately, our consultant alerted

me to the fact that this was happening, or I probably would have missed it.

So my concern is that we try to be more direct about that type of information. I realize that's probably normal procedure, and there were probably the notices in the newspapers, but I suspect that the vast majority of the public just didn't hear about it.

So I hope, perhaps, that future similar events we can do a little bit more or go that little extra step to make sure that people are opening their e-mail and reading the details.

So I think I'll stop there and we'll have, again, more comments from our counsel -- consultant. Thank you.

MS. COLE: Thank you very much. I appreciate it. Are there any other comments?

(Whereupon, a pause in proceedings.)

MS. COLE: Ms. Lepage, if you could state your name, spell your name for our stenographer, and tell us what organization you are with. Thank you very much.

MS. LEPAGE: Okay. My name is Carolyn LEPAGE, C-A-R-O-L-Y-N, L-E, small P, A-G-E. I'm a Maine certified geologist from Auburn, Maine, and I serve under contract as a technical advisor to the Seacoast Anti-Pollution League, also known as SAPL. That's S-A-P-L, all in caps.

The following comments regarding the July, 2011 proposed plan for Operable Unit 2 are presented on behalf of and with input from SAPL.

Conditional support for the preferred remedy. SAPL looks forward to the remediation of Operable Unit 2 as described in the July, 2011 proposed plans for Operable Unit 2.

For too many years, the waste materials and soils at Sites 6 and 29, have been sources of contamination migrating into the Piscataqua River; however, while SAPL supports the removal of contaminated soil from the two sites, the subsequent follow-up land use protection and monitoring, SAPL also believes there are weaknesses in the Navy

preferred alternative as follows:

Shoreline structures. A review of the history of site investigations and interim action box on page two of the proposed plan reveals a history of deterioration and failure of shoreline stabilization structures; yet, these structures are integral to the remedy in order to prevent erosion and migration of soil and contamination from the site into the adjacent river.

Has the Navy performed an assessment of these structures to ensure that they are performing as needed? At the present time, while monitoring sediment accumulation areas is necessary in the future, SAPL also believes that frequent inspections and evaluations will be needed to ensure that any structural deterioration is fixed before failure occurs.

What are the Navy's plans for inspections and repairs? How will rising sea level be factored into these plans? Should repairs or replacement become necessary, how

will the Navy prevent erosion and migration of site soils and contamination?

Sea level rise. SAPL again expresses its concern with the effect of rise of sea level on the contamination located at various sites around the Shipyard, as well as on the remedial measures taken to clean up the sites.

Rising sea level will alter the current ground water, surface water system and affect the stability of shoreline structures.

The remedy for OU2 relies heavily on the integrity of shoreline structures to maintain stability along the shoreline slopes and to prevent erosion and further migration of the waste and contaminated soil that will remain at Sites 6 and 29.

How was sea level considered in the development of potential remedies for OU2 and in the selection for the Navy's preferred alternative? What range of sea level change were considered? What are the potential future impacts to the Navy's preferred

alternative as sea level rises? How has the Navy planned to deal with potential future impacts?

Hot spot removal. The Navy is proposing to remove contaminated soil that will pose a risk to construction workers at the site; however, the target clean up level is based on averaging soil contaminant concentration, which may result in discrete areas of significant soil contamination that, for statistical reasons, fall outside the area proposed for excavation and removal.

SAPL advocates removal any hot spots of contaminated soil that would eliminate significant contamination from the site for relatively little additional cost and effort.

Future disturbance at Sites 6 and 29. The risk management decisions and remedy design for OU2 assume that the Shipyard will remain active and that the Navy will always be available to oversee and enforce land use restrictions on the OU2. But what will happen if the Shipyard closes and the Navy is no longer on the property to keep an eye

on OU2?

Recent experience at another Navy facility in Maine that recently closed has shown that security measures for even the most dangerous sites will no longer be maintained at a high level once the base closes.

Contingency for Building 310 and other structures. The Navy's preferred alternative for OU2 relies on land use controls to prevent any unauthorized disturbance of the site, including Building 310, the soil cover, and protected shoreline structures.

The building and soil cover are part of the barrier the Navy is relying on to prevent human exposure to waste and contamination that will be left on site after clean up. However, experience at other Naval facilities has shown it may become necessary to remove or repair the building or conduct some other construction activity, such as repairing or replacing protective structures along the shore that will disturb or destroy

this barrier function.

The record of decision for OU2 should specify what will happen should Building 310 be removed or other barrier components be disturbed or removed.

At a minimum, the soil beneath Building 310 should be considered for removal action.

Preference for alternative WDA-4. SAPL prefers alternative WDA-4 because it will remove a lot more of the contamination from an area that is vulnerable to erosion and sea level rise.

As noted in a comment and submitted to the Navy earlier this year, of the 44 soil samples in the WDA with concentration of lead in excess of 2000 ppm, only three were in the top two feet of the site, and 22 were located at depths of three to six feet below the ground.

The additional removal would substantially reduce the risk of human exposure and the potential for contamination to migrate to the river.

Investigation of the Western Corner of Site 6. The proposed plan for OU2 that is the subject of this public meeting and SAPL's comments as a result, are based on an incomplete picture of the nature and extent of contamination at OU2.

The Navy is currently assessing contamination in the northwest corner of Site 6. The data package that SAPL's technical advisor received only two days before this public meeting indicates there is significant contamination of soil up to the current site boundary.

While no analysis was included in the data -- with the data, it would appear that the proposed plan does not address the true nature and extent of contamination of OU2. Therefore, the comments presented in this forum or during the comment public -- or during the public comment period should not be considered final. SAPL may have additional comments and concerns once the additional data is evaluated and its impact on site-related risks and the preferred

alternatives are assessed.

To that end, SAPL recommends that the public comment period be extended until such time as the data evaluation is available to all stakeholders for review and comments. Thank you.

MS. COLE: Thank you, Ms. Lepage. Are there any other comments at this time? We still have about thirteen minutes and the public meeting will continue. Would you like to add more comments? Absolutely.

MR. BOGEN: Very brief.

MS. COLE: You've got thirteen minutes. Ms. Lepage, would you like to take the podium again?

MS. LEPAGE: My name is Carolyn Lepage, and I'd like to add one item to my previous testimony. And that is that written comments on behalf of SAPL will also be submitted at the end of the public comment period.

MS. COLE: Thank you. There's about five minutes left in the public meeting if anyone has any comments.

(Whereupon, No response.)

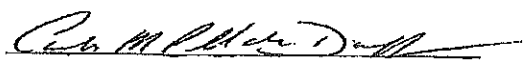
MS. COLE: It is now 8:30 on Wednesday, August the 10th. The public meeting for the Operable Unit 2 at Portsmouth Naval Shipyard is now closed. Written comments can still be submitted to the Public Affairs Office if they are postmarked or faxed by the 19th of August, and we look forward to any comments, written comments.

And I'd like to personally thank Seacoast Anti-Pollution League for your attendance and your comments this evening. Thank you all.

(Whereupon the PUBLIC HEARING concluded at 8:30 p.m.)

CERTIFICATE

I, Camille M. Palladino-Duffy, a Licensed Shorthand Reporter for the State of New Hampshire, do hereby certify that the foregoing is a true and accurate transcript of my stenographic notes of the proceeding taken at the place and on the date hereinbefore set forth to the best of my skill and ability under the conditions present at the time. I further certify that I am neither attorney or counsel for, nor related to or employed by any of the parties to the action in which this proceeding was taken, and further that I am not a relative or employee of any attorney or counsel employed in this case, nor am I financially interested in this action. The foregoing certification of this transcript does not apply to any reproduction of the same by any means unless under the direct control and/or direction of the certifying reporter.



Camille M. Palladino-Duffy

DATED: AUGUST 24, 2011

Lepage Environmental Services, Inc.
P. O. Box 1195 • Auburn, Maine 04211-1195 • 207-777-1049

FAX TRANSMISSION

TO: Donna Eddy

FAX NO.: 207 · 438-1266

FROM: Carolyn Lepage, C.G. & P.G.

DATE & TIME: 9/19/11, 3pm

TOTAL PAGES (INCLUDING THIS ONE): 5

SUBJECT: SAPL comments on the July 2011 "Proposed Plan for Operable Unit 2".

Lepage Environmental Services, Inc.

P. O. Box 1195 • Auburn, Maine • 04211-1195 • 207-777-1049

September 19, 2011

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

Subject: July 2011 *Proposed Plan for Operable Unit 2*

Dear Ms. Eddy:

This letter is submitted as requested by and on behalf of the Seacoast Anti-Pollution League (SAPL) regarding the July 2011 *Proposed Plan for Operable Unit 2, Portsmouth Naval Shipyard, Kittery, Maine* (the Proposed Plan). Most of the comments below reflect the oral comments presented on behalf of, and with input from, SAPL members at the August 10, 2011, Public Hearing held at the Kittery Town Hall.

1. Conditional Support for the Preferred Remedy. SAPL looks forward to the remediation of Operable Unit 2 as described in the July 2011 *Proposed Plan for Operable Unit 2*. For too many years, the materials and soils at Sites 6 and 29 have been sources of contamination migrating into the Piscataqua River. However, while SAPL supports the removal of contaminated soil from the two sites and subsequent follow up land-use protections and monitoring, SAPL also believes there are weaknesses in the Navy's preferred alternative as follows:

2. Shoreline Structures. A review of the "History of Site Investigations and Interim Actions" box on page 2 of the Proposed Plan reveals a history of deterioration and failure of shoreline stabilization structures. Yet these structures are integral to the remedy in order to prevent erosion and migration of soil and contamination from the site into the adjacent river.

Has the Navy performed an assessment of these structures to ensure that they are performing as needed at the present time? While monitoring sediment accumulation areas is necessary in the future, SAPL believes that frequent inspection and evaluation will also be needed to ensure that any structural deterioration is fixed before failure occurs. What are the Navy's plans for inspections and repairs? How will rising sea level be factored into the plans? Should repairs or replacement become necessary, how will the Navy prevent erosion and migration of site soils and contamination during construction?

3. Sea Level Rise. SAPL again expresses its concern with the effect of rising sea level on the contamination located at various sites around the Shipyard, as well as on the remedial measures taken to clean up the sites. Rising sea level will alter the current groundwater/surface water system and affect the stability of shoreline structures.

The remedy for OU2 relies heavily on the integrity of shoreline structures to maintain stability along the shoreline slopes and to prevent erosion and further migration of the waste and contaminated soil that will remain at Sites 6 and 29.

How was rising sea level considered in the development of potential remedies for OU2, and in the selection of the Navy's preferred alternative? What range of sea-level change was considered? What are the potential future impacts to the Navy's preferred alternative as sea level rises? How has the Navy planned to deal with the potential future impacts?

4. Hot Spot Removal. The Navy is proposing to remove contaminated soil that would pose a risk to construction workers at the site. However, the target cleanup level is based on averaging soil contaminant concentrations, which may result in discrete areas of significant soil contamination that, for statistical reasons, fall outside the area proposed for excavation and removal. SAPL advocates removal of any 'hot spots' of contaminated soil, which would eliminate significant contamination from the site for relatively little additional cost and effort.

5. Future Disturbance at Sites 6 and 29. The risk management decisions and remedy design for OU2 assume that the Shipyard will remain active and the Navy will always be available to oversee and enforce land use restrictions at OU2. But what will happen if the Shipyard closes and the Navy is no longer on the property to keep an eye on OU2? Recent experience at another Navy facility in Maine that recently closed has shown that security measures for even the most dangerous sites will no longer be maintained at a high level once a base closes.

6. Contingency for Building 310 and Other Structures. The Navy's preferred alternative for OU2 relies on land use controls to prevent any unauthorized disturbance of the site, including Building 310, the soil cover, and protective shoreline structures. The building and soil cover are part of the barrier the Navy is relying on to prevent human exposure to waste and contamination that will be left on site after cleanup. However, experience at other Naval facilities has shown that it may become necessary to remove or repair the building, or conduct some other construction activities, such as repairing or replacing protective structures along the shore, that will disturb or destroy this barrier function. The Record of Decision for OU2 should specify what will happen should Building 310 be removed or if other barrier components are disturbed or removed. At a minimum, the soil beneath Building 310 should be considered for a removal action.

As an example, a similar situation was addressed in the Record of Decision for Site 9 at the former Brunswick Naval Air Station in Brunswick, Maine. Several barracks buildings that had served as barriers to the contaminated soil beneath them were torn down. The Navy ultimately performed a soil removal action at the site to eliminate the human health risk posed by the contaminated soil.

7. Preference for Alternative WDA-4. SAPL prefers Alternative WDA-4 because it will remove a lot more of the contamination from an area that is vulnerable to erosion and sea level rise. As noted in a comment submitted earlier this year, of the 44 soil samples in the WDA with concentrations of lead in excess of 2,000 mg/kg, only three were in the top two feet of the site, and 22 were located at depths of three to six feet below ground surface. The additional removal would substantially reduce the risk of human exposure and the potential for contamination to migrate to the river, especially if the existing seawall and/or riprap were ever to fail or be compromised in a future climate regime.

8. Confusion Regarding Cleanup Level and Extent of Excavation. Table 1 in the Proposed Plan lists the cleanup levels for several contaminants of concern (COCs) for four different receptors. The driver for the Navy's preferred alternatives is the cleanup level for lead for the construction worker receptor, given as 2,000 mg/kg in Table 1. However, page 4-29 of the April 2011 "*Feasibility Study Report for Operable Unit 2*" states the following in describing Alternative DRMO-4, the Navy's preferred alternative for the DRMO portion of OU2:

"Based on the distribution of COCs, soil containing concentrations of lead greater than 4,000 milligrams per kilogram (mg/kg) ... represent the limits of the excavation area".

This is followed in the next paragraph by statements about confirmation sampling:

"*Confirmation samples would be collected from the floor and sidewalls of the excavation areas to confirm that soil with concentrations greater than construction worker PRGs have been removed. The actual limits and depths of excavation would be determined by the results of the confirmation samples.*"

The Preliminary Remediation Goal (PRG) for construction workers is listed on page 2-12 of the Feasibility Study as 2,000 mg/kg.

Although the Feasibility Study mentions 4,000 mg/kg as limiting excavation, the message the public has taken away from the Proposed Plan and the role of confirmation sampling as quoted above is that the Navy will excavate until it reaches soil with lead concentrations below 2,000 mg/kg. The Navy must be very clear in the Record of Decision exactly what the cleanup standard is. Based on the information in the Proposed Plan, the public understands that it is 2,000 mg/kg of lead.

9. Investigation at West Corner of Site 6. The Navy recently completed a pre-design investigation of the area to the west of Site 6. Because the data package was only received two days before, SAPL recommended at the August 10th public meeting that the public comment period be extended until such time as the data evaluation would be available to all stakeholders for review and comment. The Navy extended the public comment period for an additional month to allow review and consideration of the new data.

While the results of the pre-design investigation likely will not change the Navy's choice of remedy for OU2, the data indicates that there is significant contamination of soil right up to the boundary of the investigation area. Based on the cleanup levels presented in Table 1 in the

Proposed Plan (2,000 mg/kg for lead for the construction worker), it appears that several locations within the investigation area must be excavated. Excavating the areas around soil boring locations OU2-SB-400 and OU2-SB-407, in particular, will likely reach the northern and western bounds of the investigation area.

If the confirmation samples collected after the excavation reveal an exceedance of a cleanup level specified in Table 1 of the Proposed Plan, will the Navy continue excavating beyond the pre-design investigation study boundary (see Figure 3 in the July 2011 "Pre-Design Investigation Data Package for Operable Unit 2") until cleanup levels are no longer exceeded? If so, how far beyond the pre-design investigation study boundary will the Navy go if subsequent confirmation samples continue to demonstrate that cleanup levels are exceeded? If not, how will the risks associated with the remaining contamination be assessed? Would the area be considered a "new" site, that is, a site other than OU2, that requires additional evaluation? If contamination above the cleanup level is found on the existing boundary, SAPL recommends that the excavation be extended as part of the current remedy to remove this additional contamination, especially adjacent to the existing shoreline.

Please do not hesitate to contact me if you have any questions.

Sincerely,

Carolyn A. Lepage

Carolyn A. Lepage, C.G. & P.G.
President
State of Maine Certified Geologist No. GE202

cc: Doug Bogen, SAPL
Linda Cole, NAVFAC MIDLANT
Iver McLeod, MEDEP
Matthew Audet, EPA
Deborah Cohen, TetraTech

105OU2PRAP Comments19.SP1

TABLE C-1
RESPONSES TO COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD ON THE PROPOSED PLAN FOR OPERABLE UNIT 2, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Oral comments during the August 10, 2011, public hearing and written comments dated September 19, 2011, were received from one community group, Seacoast Anti-Pollution League (SAPL), on the July 2011 Proposed Plan for OU2. No changes to the remedy, as originally identified in the Proposed Plan, were necessary or appropriate based on comments received during the public comment period. A summary of the comments received and the Navy's responses to these comments are provided in the table herein.

Summary of Comments Received during the Public Comment Period and Navy Responses	
Question/Comment	**Navy Response**
SAPL indicated support for removal of contaminated soil from Sites 6 and 29 and subsequent land use protection and monitoring.	Comment noted.
SAPL indicated concern with the effect of rising sea level on the remedy. SAPL asked how sea level was considered in the development and selection of remedies for OU2, what the potential future impacts to the Navy's preferred remedy may be as sea level rises, and how the Navy will address potential future impacts from sea level rise at OU2.	An evaluation of the potential migration of contamination from OU2 soils to groundwater was conducted. The evaluation assumed worst-case conditions that the highest contamination was directly in contact with groundwater and was near the shoreline. Therefore, changes in sea level would not change the conclusions of the evaluation. The results of the evaluation, presented in the Supplemental RI Report for OU2 (March 2010), indicated that except for contaminated unsaturated zone soil in the interim capped area of Site 6, leaching of contaminants in soil would not result in unacceptable risks. The Navy's proposed remedy (Alternative DRMO-4) includes removal of the contaminated unsaturated zone soil in the interim capped area of Site 6, which will prevent unacceptable risk from contaminant migration from this area. In addition, five-year reviews will be required to ensure that the remedy remains protective of human health and the environment in the future. Changes in site conditions that could affect the protectiveness of the remedy are evaluated as part of the five-year review process.
SAPL indicated a preference for achieving the maximum reduction of contamination at OU2 from potentially vulnerable areas, including contaminant reduction beyond regulatory requirements. SAPL indicated a preference for Alternative WDA-4 over Alternative WDA-3 for this reason.	The Navy's proposed alternatives, Alternatives WDA-3 and DRMO-4, provide the best balance of tradeoffs, including long-term effectiveness, planned future use of the site, implementability, and cost, among the alternatives. The proposed alternatives provide for reduction of contamination in areas most prone to potential future erosion. Alternative WDA-3 removes contaminated surface soil, which is most vulnerable to erosion, and places a soil cover over the underlying contaminated material. Shoreline controls are present that prevent erosion of subsurface contamination near the shoreline of the waste disposal area. Additional excavation from the waste disposal area as provided in Alternative WDA-4 would not provide significant additional protection to human health and the environment to warrant the higher costs and implementability concerns associated with excavation to a greater depth. Alternative DRMO-4 removes all of the highly contaminated soil in the DRMO area, including near the shoreline.

Summary of Comments Received during the Public Comment Period and Navy Responses	
Question/Comment	**Navy Response**
SAPL indicated concern with announcement of the OU2 public meeting and commented that it would be helpful if the announcement of the OU2 public meeting was provided in an email message in addition to within the Proposed Plan.	Comment noted. The Navy followed EPA guidance for providing notification of public participation during the public comment period on the OU2 Proposed Plan. In addition to providing information about the public meeting on the cover page of the Proposed Plan (page 1), the information was provided in the legal notices in the Portsmouth Herald and Fosters Daily Democrat. Also, the Proposed Plan was distributed to community members on the Portsmouth Naval Shipyard general mailing list and Restoration Advisory Board mailing list.
SAPL indicated concern with the long-term integrity of the shoreline stabilization features because there has been past erosion along the shoreline of the site. SAPL asked whether an assessment of these structures has been conducted. SAPL asked what the Navy's plans were for inspection and repair of the structures, how rising sea level will be factored into the plans, and how the Navy will prevent erosion and migration of contamination if repairs or replacement of the structures is necessary. SAPL believes that frequent inspections to identify structural deterioration will be necessary.	Past erosion along the OU2 shoreline occurred in portions of the shoreline where shoreline stabilization features were not present. Prior to 1999, the seawall along the shoreline of the waste disposal area was the only shoreline stabilization feature. There has been no indication of erosion for this area. After soil erosion was observed along the shoreline of the DRMO Storage Yard, shoreline stabilization was conducted along this portion of the shoreline in 1999. Shoreline controls were placed east (in 2006) and west (in 2005) of the seawall where there were no controls. Additional slope stability was added at the bottom of the slope west of the seawall to prevent sloughing of the rip rap. Subsequent to placement of the shoreline controls, there has been no indication of further erosion. The proposed remedial alternatives will remove contamination most prone to potential future erosion (surface soil) and provide a soil cover over remaining contamination in the waste disposal area and will remove the contamination of most concern for potential future erosion in the DRMO area. Periodic inspections and any required maintenance based on the results of the inspections will be conducted as part of the long-term management of the site, and specific requirements will be provided in a Long-Term Management Plan. Inspections would identify any significant changes in site conditions, such as significant changes in water levels. In addition, five-year reviews will be required to ensure that the remedy remains protective of human health and the environment in the future. Changes in site conditions that could affect the protectiveness of the remedy are also evaluated as part of the five-year review process. If repairs or replacement become necessary in the future, the Navy will follow all applicable or relevant and appropriate requirements (ARARs) to prevent erosion and migration of site soils and contamination during construction.

Summary of Comments Received during the Public Comment Period and Navy Responses	
Question/Comment	**Navy Response**
SAPL indicated support for removing any hot spots of contamination that would remove significant contamination from the site.	All identified hot spots of contamination were included in the excavation areas under Alternatives WDA-3 and DRMO-4. Hot spots of contamination were evaluated in the development of potential remediation areas provided in the Feasibility Study Report for OU2 (April 2011). Alternative WDA-3 includes removal of small pockets of contamination outside of the area where the cover will be placed. There are no hot spots within the area that will have the cover. The excavation areas in Alternative DRMO-4 were delineated based on lead concentrations exceeding 4,000 mg/kg in the DRMO area. The areas based on lead concentrations will also remove unacceptable levels of the other chemicals of concern (COCs). There were no hot spots of contamination outside of the Alternative DRMO-4 excavation areas.
SAPL asked what happens if the Shipyard closes and the Navy is no longer on site to maintain critical site features such as Building 310 and the soil cover. In addition, the Record of Decision (ROD) for OU2 should specify what will happen if critical site features are removed.	Land use controls (LUCs) will be implemented within the OU2 boundary through a LUC Remedial Design (LUC RD). The LUC RD will indicate LUC-related procedures pertaining to ground-disturbing activity and changes in land use, including property transfer. The deed associated with any future transfer of property would require continued implementation of the LUCs. The Navy is responsible for implementing, maintaining, reporting on, and enforcing the LUCs. Although the Navy may later transfer these procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Navy will retain ultimate responsibility for remedy integrity.
SAPL recommended removal of soil beneath Building 310 be considered.	Building 310 would need to be removed to access soil beneath the building for removal. Therefore, exposure to contaminated material underlying the building is not a current risk. Building 310 is being used for activities that support Shipyard operations, and the Shipyard does not have current plans to discontinue or move operations from Building 310. As long as Building 310 is present, implementation of LUCs as part of Alternative WDA-3 will provide adequate protection of human health and the environment. The LUCs will be used to ensure that Building 310 remains in place unless additional action is undertaken to prevent exposure to contamination under Building 310.

Summary of Comments Received during the Public Comment Period and Navy Responses	
Question/Comment	**Navy Response**
SAPL indicated concern that the Navy's proposed remedy does not address the true nature and extent of contamination at OU2 because the investigation of contamination in the northwestern corner of Site 6 is still underway. Significant contamination of soil was found up to the current site boundary.	The maximum extent of potential impact from OU2 releases (based on past operations and physical barriers) was evaluated in the Sampling and Analysis Plan for Operable Unit 2 Pre-Design Investigation (Tetra Tech, November 2010). In the SAP, the Navy, USEPA, and MEDEP determined the maximum western OU2 boundary and decided that any hot spots of contamination found in the pre-design sampling area would be integrated into the excavation areas and that any portion causing unacceptable residential risks would be integrated into the LUC boundary for any possible selected remedy for the DRMO area. The pre-design investigation conducted in the area west of Site 6 did not provide new information that significantly changed the basic features of the Navy's proposed remedy for the DRMO area. The results of the pre-design investigation will support refinement of the western limits of the industrial excavation area on the western side of the DRMO area and refinement of the boundary for LUCs on the western side of OU2 as part of the RD. Contamination in the pre-design investigation area will be delineated based on lead concentrations exceeding 4,000 mg/kg, so the post remediation average lead concentrations will not exceed the construction worker cleanup level (2,000 mg/kg). The work plan will specify decisions based on confirmation sampling. If contamination extends beyond the investigation area, the Navy, USEPA, and MEDEP will determine if further action is necessary. However, contamination that extends beyond the pre-design investigation boundary is not part of OU2, and the Navy does not intend to excavate beyond the boundary as part of the OU2 remedial action.
SAPL expressed confusion regarding the cleanup levels in the 2011 Feasibility Study Report for OU2 versus the PRAP. The cleanup level for lead is given as 2,000 mg/kg in the PRAP, but the excavation area in the FS is based on lead concentrations exceeding 4,000 mg/kg.	The PRAP for OU2 (July 2011) specifies that cleanup levels (e.g., 2,000 mg/kg for lead for a construction worker) are based on average concentrations in soil, not maximum concentrations. Contamination in the DRMO area was delineated based on lead concentrations exceeding 4,000 mg/kg, as explained in Feasibility Study Report for OU2 (April 2011). The post remediation risks are based on average exposure concentrations which will be less than the remediation level for construction worker, occupational worker, and recreational user (2,000, 1,600, and 4,600 mg/kg, respectively) and therefore will eliminate unacceptable risks to construction workers, occupational workers, and hypothetical future residents.

Appendix D
Human Health Risk Tables

Appendix D.1

TABLE D-1
OU2 RECORD OF DECISION
TOXICITY DATA FROM 2000 HHRA
PAGE 1 OF 4

TABLE 5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
OU2
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD	Oral RfD Units	Oral to Dermal Adjustment Factor[1]	Adjusted Dermal RfD[2]	Dermal RfD Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ[3]
4,4'-DDT	chronic	5.0E-04	mg/kg-day	1	5.00E-04	mg/kg-day	Liver	100	IRIS	10/01/99
Aldrin	chronic	3.0E-05	mg/kg-day	1	3.00E-05	mg/kg-day	Liver	1,000	IRIS	10/01/99
Antimony	chronic	4.0E-04	mg/kg-day	0.15	6.00E-05	mg/kg-day	Longevity/Blood	1,000	IRIS	10/01/99
Aroclor-1254	chronic	2.0E-05	mg/kg-day	1	2.00E-05	mg/kg-day	Immunological, Nails	300	IRIS	10/01/99
Arsenic	chronic	3.0E-04	mg/kg-day	1	3.00E-04	mg/kg-day	Skin	3	IRIS	10/01/99
Barium	chronic	7.0E-02	mg/kg-day	0.07	4.90E-03	mg/kg-day	Blood Pressure	1,000	IRIS	10/01/99
Benzo(g,h,i)perylene	chronic	2.0E-02[5]	mg/kg-day	1	2.0E-02[5]	mg/kg-day	Body Weight	3,000	IRIS	10/01/99
Beryllium	chronic	2.0E-03	mg/kg-day	0.007	1.40E-05	mg/kg-day	Gastrointestinal	300	IRIS	10/01/99
Bis(2-ethylhexyl)phthalate	chronic	2.0E-02	mg/kg-day	1	2.00E-02	mg/kg-day	Liver	1,000	IRIS	10/01/99
Cadmium (food)	chronic	1.0E-03	mg/kg-day	0.05	5.00E-05	mg/kg-day	Kidney	10	IRIS	10/01/99
Cadmium (water)	chronic	5.0E-04	mg/kg-day	0.05	2.50E-05	mg/kg-day	Kidney	10	IRIS	10/01/99
Chromium	chronic	3.0E-03	mg/kg-day	0.025	7.50E-05	mg/kg-day	NOAEL	1,000	IRIS	10/01/99
Dieldrin	chronic	5.0E-05	mg/kg-day	1	5.00E-05	mg/kg-day	Liver	100	IRIS	10/01/99
Manganese (soil exposure)	chronic	7.0E-02	mg/kg-day	0.06	4.20E-03	mg/kg-day	CNS	1	EPA Region 1	08/99
Manganese (water exposure)	chronic	2.4E-02	mg/kg-day	0.06	1.44E-03	mg/kg-day	CNS	1	EPA Region 1	08/99
Mercury (Mercuric Chloride)	chronic	3.0E-04	mg/kg-day	0.07	2.10E-05	mg/kg-day	Autoimmune System	1,000	IRIS	10/01/99
Nickel	chronic	2.0E-02	mg/kg-day	0.04	8.00E-04	mg/kg-day	Decreased body / organ weights	300	IRIS	10/01/99
Phenanthrene	chronic	2.0E-02[5]	mg/kg-day	1	2.0E-02[5]	mg/kg-day	Body Weight	3,000	IRIS	10/01/99
Selenium	chronic	5.0E-03	mg/kg-day	1	5.00E-03	mg/kg-day	Hair / Nails	3	IRIS	10/01/99
Silver	chronic	5.0E-03	mg/kg-day	0.04	2.00E-04	mg/kg-day	Argyria	3	IRIS	10/01/99
Thallium	chronic	7.0E-05	mg/kg-day	1	7.00E-05	mg/kg-day			OTHER[4]	10/01/99
Vanadium	chronic	7.0E-03	mg/kg-day	0.026	1.82E-04	mg/kg-day	Lifetime	100	HEAST	07/97
Zinc	chronic	3.0E-01	mg/kg-day	1	3.00E-01	mg/kg-day	Blood	3	IRIS	10/01/99

(1) USEPA, 1998
(2) RfD dermal = RfDoral x (Oral to Dermal Adjustment Factor)
(3) Dates of IRIS, HEAST, or NCEA
(4) USEPA Region III RBC Table, October 1999
(5) Naphthlene is used as a surrogate for benzo(g,h,i)perylene and phenanthrene.

Notes: RfD = Reference dose
CNS = Central Nervous System
IRIS = Integrated Risk Information System, on-line database search (USEPA, December 1999)
HEAST = Health Effects Assessment Summary Tables (USEPA, July 1997)
NCEA = USEPA National Center for Environmental Assessment (USEPA Region III RBC Table, October, 27 1999)
NA = Not applicable since an oral RfD is not available for this compound data
NOAEL = No Observed Adverse Effect Level

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

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TOXICITY DATA FROM 2000 HHRA
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TABLE 5.2

NON-CANCER TOXICITY DATA -- INHALATION

OU2

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD: Target Organ	Date
Chromium	Chronic	1.0E-01	$\mu g/m^3$	2.9E-05	mg/kg-day	NOAEL	300	IRIS	10/27/99

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-1
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TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
OU2
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Chemical of Potential Concern	Oral CSF	Oral to Dermal Adjustment Factor[1]	Adjusted Dermal Cancer Slope Factor[2]	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date[3]
2378-TCDD EQUIVALENT	1.5E+05	1	1.50E+05	$(mg/kg\text{-}day)^{-1}$	B2	HEAST	07/97
4,4'-DDD	2.4E-01	1	2.40E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	10/1/99
4,4'-DDE	3.4E-01	1	3.40E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	10/1/99
4,4'-DDT	3.4E-01	1	3.40E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	10/1/99
Aldrin	1.7E+01	1	1.70E+01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	10/1/99
Aroclor-1242	2.0E+00	1	2.00E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	10/1/99
Aroclor-1248	2.0E+00	1	2.00E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	10/1/99
Aroclor-1254	2.0E+00	1	2.00E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	10/1/99
Aroclor-1260	2.0E+00	1	2.00E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	10/1/99
Arsenic	1.5E+00	1	1.50E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	10/1/99
BAP EQUIVALENT	7.3E+00	1	7.30E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	10/1/99
Benzo(a)anthracene	7.3E-01	1	7.30E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	10/1/99
Benzo(a)pyrene	7.3E+00	1	7.30E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	10/1/99
Benzo(b)fluoranthene	7.3E-01	1	7.30E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	10/1/99
Benzo(k)fluoranthene	7.3E-02	1	7.30E-02	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	10/1/99
Bis(2-ethylhexyl)phthalate	1.4E-02	1	1.40E-02	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	10/1/99
Dibenzo(a,h)anthracene	7.3E+00	1	7.30E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	10/1/99
Dieldrin	1.6E+01	1	1.60E+01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	10/1/99
Indeno(1,2,3-cd)pyrene	7.3E-01	1	7.30E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	10/1/99

(1) USEPA, 1998
(2) CSFdermal = CSForal/(Oral to Dermal Adjustment Factor)
(3) Dates of IRIS, HEAST, or NCEA.

Notes:
CSF = Cancer Slope Factor
IRIS = Integrated Risk Information System, on-line database search (USEPA, December1999)
HEAST = Health Effects Assessment Summary Tables (USEPA, July 1997)
NCEA = USEPA National Center for Environmental Assessment
(USEPA Region III RBC Table, October 27,1999)
NA = Not Applicable since oral CSF is not available

EPA Group:
A - Human carcinogen
B1 - Probable human carcinogen - indicates that limited human data are available
B2 - Probable human carcinogen - indicates sufficient evidence in anima and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

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TOXICITY DATA FROM 2000 HHRA
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TABLE 6.2

CANCER TOXICITY DATA -- INHALATION

OU2

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Chemical of Potential Concern	Unit Risk	Units	Adjustment	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
2378-TCDD EQUIVALENT	4.3E+01	$(\mu g/m^3)^{-1}$	3.5E+03	1.50E+05	$(mg/kg\text{-}day)^{-1}$	B2	HEAST	07/97
Chromium	1.2E-02	$(\mu g/m^3)^{-1}$	3.5E+03	4.10E+01	$(mg/kg\text{-}day)^{-1}$	A	IRIS	10/27/99

IRIS = Integrated Risk Information System

HEAST= Health Effects Assessment Summary Tables

NCEA = USEPA National Center for Environmental Assessment

(USEPA Region III RBC Table, October 27,1999)

EPA Group:

A - Human carcinogen

B1 - Probable human carcinogen - indicates that limited human data are avallable

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

E - Evidence of noncarcinogenicity

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-2
OU2 RECORD OF DECISION
SITE 6 RELATED RISK TABLES FROM 2000 HHRA
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TABLE B.1-3.1
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY FOR RESIDENTIAL EXPOSURES - SURFACE SOIL (0 - 2 feet)
SITE 6 - DRMO
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current / Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Entire Site 6

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)anthracene	mg/kg	5.07E+00	9.47E+00	1.90E+01		mg/kg	1.90E+01	Maximum	W - Test (5a)	1.90E+01	Maximum	W - Test (5a)
Benzo(a)pyrene	mg/kg	4.93E+00	8.94E+00	1.60E+01		mg/kg	1.60E+01	Maximum	W - Test (5a)	1.60E+01	Maximum	W - Test (5a)
Benzo(b)fluoranthene	mg/kg	5.04E+00	9.04E+00	1.70E+01		mg/kg	1.70E+01	Maximum	W - Test (5a)	1.70E+01	Maximum	W - Test (5a)
Benzo(k)fluoranthene	mg/kg	4.92E+00	8.98E+00	1.80E+01		mg/kg	1.80E+01	Maximum	W - Test (5a)	1.80E+01	Maximum	W - Test (5a)
Dibenzo(a,h)anthracene	mg/kg	3.29E+00	7.06E+00	3.80E-01	J	mg/kg	3.80E-01	Maximum	W - Test (5a)	3.80E-01	Maximum	W - Test (5a)
Indeno(1,2,3-cd)pyrene	mg/kg	3.59E+00	7.34E+00	5.70E+00	J	mg/kg	5.70E+00	Maximum	W - Test (5a)	5.70E+00	Maximum	W - Test (5a)
Benzo(g,h,i)perylene	mg/kg	3.69E+00	7.44E+00	5.70E+00		mg/kg	5.70E+00	Maximum	W - Test (5a)	5.70E+00	Maximum	W - Test (5a)
Phenanthrene	mg/kg	5.22E+00	9.30E+00	1.10E+01	J	mg/kg	1.10E+01	Maximum	W - Test (5a)	1.10E+01	Maximum	W - Test (5a)
Bis(2-ethylhexyl)phthalate	mg/kg	1.07E+01	2.70E+01	1.10E+02		mg/kg	7.11E+01	95% UCL-T	W - Test (3)	7.11E+01	95% UCL-T	W - Test (3)
Aldrin	mg/kg	2.32E-02	3.40E-02	1.10E-01		mg/kg	4.92E-02	95% UCL-T	W - Test (3)	4.92E-02	95% UCL-T	W - Test (3)
Aroclor-1242	mg/kg	1.80E-01	2.42E-01	3.70E-01		mg/kg	3.07E-01	95% UCL-T	W - Test (3)	3.07E-01	95% UCL-T	W - Test (3)
Aroclor-1248	mg/kg	1.24E+00	2.64E+00	1.75E+01		mg/kg	2.31E+00	95% UCL-T	W - Test (3)	2.31E+00	95% UCL-T	W - Test (3)
Aroclor-1254	mg/kg	4.26E+00	7.50E+00	4.15E+01		mg/kg	2.22E+01	95% UCL-T	W - Test (2)	2.22E+01	95% UCL-T	W - Test (2)
Aroclor-1260	mg/kg	8.78E-01	1.49E+00	7.75E+00	J	mg/kg	1.80E+00	95% UCL-T	W - Test (2)	1.80E+00	95% UCL-T	W - Test (2)
Dieldrin	mg/kg	6.80E-02	9.84E-02	2.60E-01		mg/kg	1.83E-01	95% UCL-T	W - Test (2)	1.83E-01	95% UCL-T	W - Test (2)
Antimony	mg/kg	4.15E+02	8.82E+02	6.51E+03		mg/kg	1.43E+03	95% UCL-T	W - Test (2)	1.43E+03	95% UCL-T	W - Test (2)
Arsenic	mg/kg	1.66E+01	1.96E+01	5.63E+01	J	mg/kg	1.96E+01	95% UCL-N	W - Test (4)	1.96E+01	95% UCL-N	W - Test (4)
Barium	mg/kg	2.58E+02	3.19E+02	5.92E+02		mg/kg	3.79E+02	95% UCL-T	W - Test (2)	3.79E+02	95% UCL-T	W - Test (2)
Beryllium	mg/kg	2.69E+00	4.94E+00	3.22E+01	J	mg/kg	3.35E+00	95% UCL-T	W - Test (3)	3.35E+00	95% UCL-T	W - Test (3)
Cadmium	mg/kg	4.93E+00	6.09E+00	1.54E+01		mg/kg	6.77E+00	95% UCL-T	W - Test (2)	6.77E+00	95% UCL-T	W - Test (2)
Chromium	mg/kg	8.11E+01	1.01E+02	3.57E+02	J	mg/kg	1.05E+02	95% UCL-T	W - Test (2)	1.05E+02	95% UCL-T	W - Test (2)
Lead	mg/kg	2.74E+04	4.37E+04	2.55E+05	J	mg/kg	2.74E+04	Average	NA	NA	NA	NA
Manganese	mg/kg	5.57E+02	6.75E+02	1.02E+03		mg/kg	7.25E+02	95% UCL-T	W - Test (2)	7.25E+02	95% UCL-T	W - Test (2)
Mercury	mg/kg	2.00E+00	3.73E+00	2.00E+01		mg/kg	4.79E+00	95% UCL-T	W - Test (2)	4.79E+00	95% UCL-T	W - Test (2)
Nickel	mg/kg	2.96E+02	4.55E+02	2.67E+03		mg/kg	4.34E+02	95% UCL-T	W - Test (2)	4.34E+02	95% UCL-T	W - Test (2)
Thallium	mg/kg	5.60E-01	7.62E-01	2.60E+00	J	mg/kg	7.95E-01	95% UCL-T	W - Test (3)	7.95E-01	95% UCL-T	W - Test (3)
Vanadium	mg/kg	3.61E+01	4.12E+01	6.76E+01		mg/kg	4.12E+01	95% UCL-N	W - Test (1)	4.12E+01	95% UCL-N	W - Test (1)
Zinc	mg/kg	2.31E+03	3.62E+03	1.99E+04	J	mg/kg	4.56E+03	95% UCL-T	W - Test (2)	4.56E+03	95% UCL-T	W - Test (2)
BAP EQUIVALENT	mg/kg	5.61E+00	5.24E+01	2.06E+01		mg/kg	2.06E+01	Maximum	W - Test (5a)	2.06E+01	Maximum	W - Test (5a)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test indicates data are normally distributed.
(2) Shapiro-Wilk W Test indicates data are log-normally distributed.
(3) Shapiro-Wilk W Test is inconclusive. Best fit is a log-normal distribution.
(4) Shapiro-Wilk W Test is inconclusive. Best fit is a normal distribution.
(5) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration is used for the RME and CTE.
(5a) Best fit is a log-normal distribution. See Table B.1-3.1A for statistical summary.

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Table3SurfSoilSite6F.xls

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SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

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SITE 6 RELATED RISK TABLES FROM 2000 HHRA
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TABLE B.1-3.3
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY FOR RESIDENTIAL EXPOSURES - SURFACE AND SUBSURFACE SOIL (0 - 10 feet)
SITE 6 - DRMO
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface and Subsurface Soil
Exposure Point: Entire Site 6

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)anthracene	mg/kg	5.07E+00	9.47E+00	1.90E+01		mg/kg	1.90E+01	Maximum	W - Test (5a)	1.90E+01	Maximum	W - Test (5a)
Benzo(a)pyrene	mg/kg	4.93E+00	8.94E+00	1.60E+01		mg/kg	1.60E+01	Maximum	W - Test (5a)	1.60E+01	Maximum	W - Test (5a)
Benzo(b)fluoranthene	mg/kg	5.04E+00	9.04E+00	1.70E+01		mg/kg	1.70E+01	Maximum	W - Test (5a)	1.70E+01	Maximum	W - Test (5a)
Benzo(k)fluoranthene	mg/kg	4.92E+00	8.98E+00	1.80E+01		mg/kg	1.80E+01	Maximum	W - Test (5a)	1.80E+01	Maximum	W - Test (5a)
Dibenzo(a,h)anthracene	mg/kg	3.29E+00	7.06E+00	3.80E-01	J	mg/kg	3.80E-01	Maximum	W - Test (5a)	3.80E-01	Maximum	W - Test (5a)
Indeno(1,2,3-cd)pyrene	mg/kg	3.59E+00	7.34E+00	5.70E+00	J	mg/kg	5.70E+00	Maximum	W - Test (5a)	5.70E+00	Maximum	W - Test (5a)
Benzo(g,h,i)perylene	mg/kg	3.69E+00	7.44E+00	5.70E+00		mg/kg	5.70E+00	Maximum	W - Test (5a)	5.70E+00	Maximum	W - Test (5a)
Phenanthrene	mg/kg	5.22E+00	9.30E+00	1.10E+01	J	mg/kg	1.10E+01	Maximum	W - Test (5a)	1.10E+01	Maximum	W - Test (5a)
Bis(2-ethylhexyl)phthalate	mg/kg	1.07E+01	2.70E+01	1.10E+02		mg/kg	7.11E+01	95% UCL-T	W - Test (3)	7.11E+01	95% UCL-T	W - Test (3)
Aldrin	mg/kg	2.12E-02	3.06E-02	1.10E-01		mg/kg	3.75E-02	95% UCL-T	W - Test (3)	3.75E-02	95% UCL-T	W - Test (3)
Aroclor-1242	mg/kg	1.85E-01	2.44E-01	3.70E-01		mg/kg	2.83E-01	95% UCL-T	W - Test (3)	2.83E-01	95% UCL-T	W - Test (3)
Aroclor-1248	mg/kg	1.10E+00	2.23E+00	1.75E+01		mg/kg	1.65E+00	95% UCL-T	W - Test (3)	1.65E+00	95% UCL-T	W - Test (3)
Aroclor-1254	mg/kg	3.99E+00	6.69E+00	4.15E+01		mg/kg	1.63E+01	95% UCL-T	W - Test (2)	1.63E+01	95% UCL-T	W - Test (2)
Aroclor-1260	mg/kg	9.29E-01	1.46E+00	7.75E+00	J	mg/kg	1.76E+00	95% UCL-T	W - Test (2)	1.76E+00	95% UCL-T	W - Test (2)
Dieldrin	mg/kg	6.12E-02	8.79E-02	2.80E-01		mg/kg	1.31E-01	95% UCL-T	W - Test (2)	1.31E-01	95% UCL-T	W - Test (2)
Antimony	mg/kg	3.47E+02	7.34E+02	6.51E+03		mg/kg	1.17E+03	95% UCL-T	W - Test (2)	1.17E+03	95% UCL-T	W - Test (2)
Arsenic	mg/kg	1.56E+01	1.83E+01	5.63E+01		mg/kg	1.83E+01	95% UCL-N	W - Test (4)	1.83E+01	95% UCL-N	W - Test (4)
Barium	mg/kg	2.49E+02	3.09E+02	5.92E+02	J	mg/kg	3.69E+02	95% UCL-T	W - Test (2)	3.69E+02	95% UCL-T	W - Test (2)
Beryllium	mg/kg	2.40E+00	4.33E+00	3.22E+01		mg/kg	2.67E+00	95% UCL-T	W - Test (3)	2.67E+00	95% UCL-T	W - Test (3)
Cadmium	mg/kg	4.59E+00	5.62E+00	1.64E+01	J	mg/kg	6.15E+00	95% UCL-T	W - Test (2)	6.15E+00	95% UCL-T	W - Test (2)
Chromium	mg/kg	7.73E+01	9.46E+01	3.57E+02		mg/kg	9.58E+01	95% UCL-T	W - Test (2)	9.58E+01	95% UCL-T	W - Test (2)
Lead	mg/kg	2.40E+04	3.81E+04	2.55E+05	J	mg/kg	2.40E+04	Average	NA	NA	NA	NA
Manganese	mg/kg	5.46E+02	6.58E+02	1.02E+03	J	mg/kg	6.98E+02	95% UCL-T	W - Test (2)	6.98E+02	95% UCL-T	W - Test (2)
Mercury	mg/kg	1.75E+00	3.16E+00	2.00E+01		mg/kg	4.40E+00	95% UCL-T	W - Test (2)	4.40E+00	95% UCL-T	W - Test (2)
Nickel	mg/kg	2.87E+02	4.25E+02	2.67E+03		mg/kg	3.99E+02	95% UCL-T	W - Test (2)	3.99E+02	95% UCL-T	W - Test (2)
Thallium	mg/kg	5.28E-01	7.02E-01	2.60E+00		mg/kg	7.15E-01	95% UCL-T	W - Test (3)	7.15E-01	95% UCL-T	W - Test (3)
Vanadium	mg/kg	3.53E+01	4.03E+01	6.76E+01	J	mg/kg	4.03E+01	95% UCL-N	W - Test (1)	4.03E+01	95% UCL-N	W - Test (1)
Zinc	mg/kg	2.04E+03	3.19E+03	1.99E+04		mg/kg	1.50E+04	95% UCL-T	W - Test (3)	1.50E+04	95% UCL-T	W - Test (3)
BAP EQUIVALENT	mg/kg	5.61E+00	5.24E+01	2.06E+01		mg/kg	2.06E+01	Maximum	W - Test (5a)	2.06E+01	Maximum	W - Test (5a)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test indicates data are normally distributed.
(2) Shapiro-Wilk W Test indicates data are log-normally distributed.
(3) Shapiro-Wilk W Test is inconclusive. Best fit is a log-normal distribution.
(4) Shapiro-Wilk W Test is inconclusive. Best fit is a normal distribution.
(5) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration is used for the RME and CTE.
(5a) Best fit is a log-normal distribution. See Table B.1-3.3A for statistical summary.

Table3ALLSoilSite6F.xls

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-2
OU2 RECORD OF DECISION
SITE 6 RELATED RISK TABLES FROM 2000 HHRA
PAGE 3 OF 10

TABLE B.1-3.2
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY FOR COMMERCIAL / INDUSTRIAL EXPOSURES - SURFACE SOIL (0 - 2 feet)
SITE 6 - DRMO
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current / Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Entire Site 6

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)anthracene	mg/kg	5.07E+00	9.47E+00	1.90E+01		mg/kg	1.90E+01	Maximum	W - Test (5a)	1.90E+01	Maximum	W - Test (5a)
Benzo(a)pyrene	mg/kg	4.93E+00	8.94E+00	1.60E+01		mg/kg	1.60E+01	Maximum	W - Test (5a)	1.60E+01	Maximum	W - Test (5a)
Benzo(b)fluoranthene	mg/kg	5.04E+00	9.04E+00	1.70E+01		mg/kg	1.70E+01	Maximum	W - Test (5a)	1.70E+01	Maximum	W - Test (5a)
Dibenzo(a,h)anthracene	mg/kg	3.29E+00	7.06E+00	3.80E-01	J	mg/kg	3.80E-01	Maximum	W - Test (5a)	3.80E-01	Maximum	W - Test (5a)
Indeno(1,2,3-cd)pyrene	mg/kg	3.59E+00	7.34E+00	5.70E+00	J	mg/kg	5.70E+00	Maximum	W - Test (5a)	5.70E+00	Maximum	W - Test (5a)
Aroclor-1248	mg/kg	1.24E+00	2.64E+00	1.75E+01		mg/kg	2.31E+00	95% UCL-T	W - Test (3)	2.31E+00	95% UCL-T	W - Test (3)
Aroclor-1254	mg/kg	4.26E+00	7.50E+00	4.15E+01		mg/kg	2.22E+01	95% UCL-T	W - Test (2)	2.22E+01	95% UCL-T	W - Test (2)
Aroclor-1260	mg/kg	8.78E-01	1.49E+00	7.75E+00	J	mg/kg	1.80E+00	95% UCL-T	W - Test (2)	1.80E+00	95% UCL-T	W - Test (2)
Dieldrin	mg/kg	6.80E-02	9.84E-02	2.80E-01		mg/kg	1.83E-01	95% UCL-T	W - Test (2)	1.83E-01	95% UCL-T	W - Test (2)
Antimony	mg/kg	4.15E+02	8.82E+02	6.51E+03		mg/kg	1.43E+03	95% UCL-T	W - Test (2)	1.43E+03	95% UCL-T	W - Test (2)
Arsenic	mg/kg	1.66E+01	1.96E+01	5.63E+01	J	mg/kg	1.96E+01	95% UCL-N	W - Test (4)	1.96E+01	95% UCL-N	W - Test (4)
Chromium	mg/kg	8.11E+01	1.01E+02	3.57E+02	J	mg/kg	1.05E+02	95% UCL-T	W - Test (2)	1.05E+02	95% UCL-T	W - Test (2)
Lead	mg/kg	2.74E+04	4.37E+04	2.55E+05	J	mg/kg	2.74E+04	Average	NA	NA	NA	NA
BAP EQUIVALENT	mg/kg	5.61E+00	5.24E+01	2.06E+01		mg/kg	2.06E+01	Maximum	W - Test (5a)	2.06E+01	Maximum	W - Test (5a)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test indicates data are normally distributed.
(2) Shapiro-Wilk W Test indicates data are log-normally distributed.
(3) Shapiro-Wilk W Test is inconclusive. Best fit is a log-normal distribution.
(4) Shapiro-Wilk W Test is inconclusive. Best fit is a normal distribution.
(5) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration is used for the RME and CTE.
(5a) Best fit is a log-normal distribution. See Table B.1-3.1A for statistical summary.

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Table3SurfSoilSite6FIND.xls

3/22/00 11:10 AM

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

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SITE 6 RELATED RISK TABLES FROM 2000 HHRA
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TABLE B.1-3.4
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY FOR COMMERCIAL / INDUSTRIAL EXPOSURES- SURFACE AND SUBSURFACE SOIL (0 - 10 feet)
SITE 6 - DRMO
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current / Future
Medium: Soil
Exposure Medium: Surface and Subsurface Soil
Exposure Point: Entire Site 6

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)anthracene	mg/kg	5.07E+00	9.47E+00	1.90E+01		mg/kg	1.90E+01	Maximum	W - Test (5a)	1.90E+01	Maximum	W - Test (5a)
Benzo(a)pyrene	mg/kg	4.93E+00	8.94E+00	1.60E+01		mg/kg	1.60E+01	Maximum	W - Test (5a)	1.60E+01	Maximum	W - Test (5a)
Benzo(b)fluoranthene	mg/kg	5.04E+00	9.04E+00	1.70E+01		mg/kg	1.70E+01	Maximum	W - Test (5a)	1.70E+01	Maximum	W - Test (5a)
Dibenzo(a,h)anthracene	mg/kg	3.29E+00	7.06E+00	3.80E-01	J	mg/kg	3.80E-01	Maximum	W - Test (5a)	3.80E-01	Maximum	W - Test (5a)
Indeno(1,2,3-cd)pyrene	mg/kg	3.59E+00	7.34E+00	5.70E+00	J	mg/kg	5.70E+00	Maximum	W - Test (5a)	5.70E+00	Maximum	W - Test (5a)
Aroclor-1248	mg/kg	1.10E+00	2.23E+00	1.75E+01		mg/kg	1.65E+00	95% UCL-T	W - Test (3)	1.65E+00	95% UCL-T	W - Test (3)
Aroclor-1254	mg/kg	3.99E+00	6.69E+00	4.15E+01		mg/kg	1.63E+01	95% UCL-T	W - Test (2)	1.63E+01	95% UCL-T	W - Test (2)
Aroclor-1260	mg/kg	9.29E-01	1.46E+00	7.75E+00	J	mg/kg	1.76E+00	95% UCL-T	W - Test (2)	1.76E+00	95% UCL-T	W - Test (2)
Dieldrin	mg/kg	6.12E-02	8.79E-02	2.80E-01		mg/kg	1.31E-01	95% UCL-T	W - Test (2)	1.31E-01	95% UCL-T	W - Test (2)
Antimony	mg/kg	3.47E+02	7.34E+02	6.51E+03		mg/kg	1.17E+03	95% UCL-T	W - Test (2)	1.17E+03	95% UCL-T	W - Test (2)
Arsenic	mg/kg	1.56E+01	1.83E+01	5.63E+01		mg/kg	1.83E+01	95% UCL-N	W - Test (4)	1.83E+01	95% UCL-N	W - Test (4)
Chromium	mg/kg	7.73E+01	9.46E+01	3.57E+02		mg/kg	9.58E+01	95% UCL-T	W - Test (2)	9.58E+01	95% UCL-T	W - Test (2)
Lead	mg/kg	2.40E+04	3.81E+04	2.55E+05	J	mg/kg	2.40E+04	Average	NA	NA	NA	NA
BAP EQUIVALENT	mg/kg	5.61E+00	5.24E+01	2.06E+01		mg/kg	2.06E+01	Maximum	W - Test (5a)	2.06E+01	Maximum	W - Test (5a)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test indicates data are normally distributed.
(2) Shapiro-Wilk W Test indicates data are log-normally distributed.
(3) Shapiro-Wilk W Test is inconclusive. Best fit is a log-normal distribution.
(4) Shapiro-Wilk W Test is inconclusive. Best fit is a normal distribution.
(5) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration is used for the RME and CTE.
(5a) Best fit is a log-normal distribution. See Table B.1-3.3A for statistical summary.

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Table3ALLSoilSite6FIND.xls

3/22/00 11:14 AM

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-2
OU2 RECORD OF DECISION
SITE 6 RELATED RISK TABLES FROM 2000 HHRA
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TABLE B.1-9-1. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKER
SITE 6 - SURFACE SOIL
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current / Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Entire Site 6	Benzo(a)anthracene	5.6E-07		1.1E-07	6.7E-07	Benzo(a)anthracene					
			Benzo(a)pyrene	4.7E-06		9.6E-07	5.7E-06	Benzo(a)pyrene					
			Benzo(b)fluoranthene	5.0E-07		1.0E-07	6.0E-07	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	1.1E-07		2.3E-08	1.3E-07	Dibenzo(a,h)anthracene					
			Indeno(1,2,3-cd)pyrene	1.7E-07		3.4E-08	2.0E-07	Indeno(1,2,3-cd)pyrene					
			Aroclor-1248	1.3E-07		2.9E-08	1.6E-07	Aroclor-1248					
			Aroclor-1254	1.3E-06		2.9E-07	1.6E-06	Aroclor-1254	Immunological, Nails	2.3E+00		5.0E-01	2.8E+00
			Aroclor-1260	1.4E-07		3.1E-08	1.7E-07	Aroclor-1260					
			Dieldrin	8.4E-08			8.4E-08	Dieldrin	Liver	7.4E-03			7.4E-03
			Antimony					Antimony	Longevity/Blood	8.2E+00			8.2E+00
			Arsenic	1.1E-06		5.2E-08	1.2E-06	Arsenic	Skin	1.7E-01		8.1E-03	1.8E-01
			Chromium		1.1E-09		1.1E-09	Chromium	NOAEL	9.0E-02	6.2E-05		9.0E-02
			Lead					Lead					
Groundwater	Groundwater	Entire OU2	Antimony					Antimony	Longevity/Blood			5.4E-02	5.4E-02
			Arsenic			1.8E-07	1.8E-07	Arsenic	Skin			2.8E-02	2.8E-02
			Chromium					Chromium	NOAEL			3.9E-02	3.9E-02
			Lead					Lead					
			Manganese					Manganese	CNS			5.0E-01	5.0E-01
			Nickel					Nickel	Decreased body / organ weights			1.9E-02	1.9E-02

Total Risk Across Surface Soil	1.0E-05
Total Risk Across Groundwater	1.8E-07
Total Risk Across All Media and All Exposure Routes	1.1E-05

Total Hazard Index Across All Media and All Exposure Routes	1.2E+01

Total Body Weight HI =	1.9E-02
Total CNS HI =	5.0E-01
Total Blood HI =	8.3E+00
Total Skin HI =	2.1E-01
Total Lifetime HI =	8.3E+00
Total Immune System HI =	2.8E+00
Total Liver HI =	7.4E-03

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Table9ConstWSite6ALLSoilRMEIND.xls

3/22/00 12:45 PM

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-2
OU2 RECORD OF DECISION
SITE 6 RELATED RISK TABLES FROM 2000 HHRA
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TABLE B.1-9.2. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - COMMERCIAL WORKER
SITE 6 - SURFACE SOIL
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current / Future
Receptor Population: Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Entire Site 6	Benzo(a)anthracene	2.9E-06		1.9E-06	4.8E-06	Benzo(a)anthracene					
			Benzo(a)pyrene	2.4E-05		1.6E-05	4.0E-05	Benzo(a)pyrene					
			Benzo(b)fluoranthene	2.6E-06		1.7E-06	4.3E-06	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	5.8E-07		3.8E-07	9.6E-07	Dibenzo(a,h)anthracene					
			Indeno(1,2,3-cd)pyrene	8.7E-07		5.7E-07	1.4E-06	Indeno(1,2,3-cd)pyrene					
			Aroclor-1248	9.7E-07		6.8E-07	1.6E-06	Aroclor-1248					
			Aroclor-1254	9.3E-06		6.5E-06	1.6E-05	Aroclor-1254	Immunological, Nails	6.5E-01		4.6E-01	1.1E+00
			Aroclor-1260	7.6E-07		5.3E-07	1.3E-06	Aroclor-1260					
			Dieldrin	6.1E-07			6.1E-07	Dieldrin	Liver	2.1E-03			2.1E-03
			Antimony					Antimony	Longevity/Blood	2.1E+00			2.1E+00
			Arsenic	6.2E-06		9.3E-07	7.1E-06	Arsenic	Skin	3.8E-02		5.8E-03	4.4E-02
			Chromium		2.3E-08		2.3E-08	Chromium	NOAEL	2.0E-02	5.2E-05		2.1E-02
			Lead					Lead					
			Total Risk Across Surface Soil				7.8E-05	Total Hazard Index Across All Media and All Exposure Routes					3.3E+00

Total Risk Across All Media and All Exposure Routes: 7.8E-05

Total Blood HI = 2.1E+00
Total Skin HI = 4.4E-02
Total Lifetime HI = 2.1E+00
Total Immune System HI = 1.1E+00
Total Liver HI = 2.1E-03

87000

Table9CommercialSite6SurfSoilRMEIND.xls

3/22/00 12:46 PM

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-2
OU2 RECORD OF DECISION
SITE 6 RELATED RISK TABLES FROM 2000 HHRA
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TABLE B.1-9.3. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADULT RECREATIONAL USER
SITE 6 - SURFACE SOIL
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current / Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Entire Site 6	Benzo(a)anthracene	4.6E-07		5.0E-07	9.9E-07	Benzo(a)anthracene					
			Benzo(a)pyrene	4.1E-06		4.2E-06	8.3E-06	Benzo(a)pyrene					
			Benzo(b)fluoranthene	4.3E-07		4.5E-07	8.8E-07	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	9.7E-08		1.0E-07	2.0E-07	Dibenzo(a,h)anthracene					
			Indeno(1,2,3-cd)pyrene	1.5E-07		1.5E-07	3.0E-07	Indeno(1,2,3-cd)pyrene					
			Aroclor-1248	1.6E-07		1.8E-07	3.4E-07	Aroclor-1248					
			Aroclor-1254	1.5E-06		1.7E-06	3.3E-06	Aroclor-1254	Immunological, Nails	1.1E-01		1.3E-01	2.4E-01
			Aroclor-1260	1.3E-07		1.4E-07	2.7E-07	Aroclor-1260					
			Dieldrin	1.0E-07			1.0E-07	Dieldrin	Liver	3.7E-04			3.7E-04
			Antimony					Antimony	Longevity/Blood	3.6E-01			3.6E-01
			Arsenic	1.0E-06		2.5E-07	1.3E-06	Arsenic	Skin	6.7E-03		1.6E-03	8.2E-03
			Chromium		1.8E-09		1.8E-09	Chromium	NOAEL	3.5E-03	4.3E-06		3.6E-03
			Lead					Lead					
			Total Risk Across Surface Soil				1.6E-05		Total Hazard Index Across All Media and All Exposure Routes				6.2E-01

Total Risk Across All Media and All Exposure Routes: 1.6E-05

Total Blood HI =	3.6E-01
Total Skin HI =	8.2E-03
Total Lifetme HI =	3.6E-01
Total Immune System HI =	2.4E-01
Total Liver HI =	3.7E-04

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-2
OU2 RECORD OF DECISION
SITE 6 RELATED RISK TABLES FROM 2000 HHRA
PAGE 8 OF 10

TABLE 8.1-9.4. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CHILD RECREATIONAL USER
SITE 6 - SURFACE SOIL
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current / Future
Receptor Population: Recreational User
Receptor Age: Child (0-6 Years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Entire Site 6	Benzo(a)anthracene	1.1E-06		8.5E-07	2.0E-06	Benzo(a)anthracene					
			Benzo(a)pyrene	9.5E-06		7.2E-06	1.7E-05	Benzo(a)pyrene					
			Benzo(b)fluoranthene	1.0E-06		7.6E-07	1.8E-06	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	2.3E-07		1.7E-07	4.0E-07	Dibenzo(a,h)anthracene					
			Indeno(1,2,3-cd)pyrene	3.4E-07		2.6E-07	5.9E-07	Indeno(1,2,3-cd)pyrene					
			Aroclor-1248	3.8E-07		3.0E-07	6.8E-07	Aroclor-1248					
			Aroclor-1254	3.6E-06		2.9E-06	6.6E-06	Aroclor-1254	Immunological, Nails	1.1E+00		8.6E-01	1.9E+00
			Aroclor-1260	2.9E-07		2.4E-07	5.3E-07	Aroclor-1260					
			Dieldrin	2.4E-07			2.4E-07	Dieldrin	Liver	3.5E-03			3.5E-03
			Antimony					Antimony	Longevity/Blood	3.4E+00			3.4E+00
			Arsenic	2.4E-06		4.2E-07	2.8E-06	Arsenic	Skin	6.2E-02		1.1E-02	7.3E-02
			Chromium		1.4E-09		1.4E-09	Chromium	NOAEL	3.3E-02	1.3E-05		3.3E-02
			Lead					Lead					
				Total Risk Across Surface Soil			3.2E-05		Total Hazard Index Across All Media and All Exposure Routes				5.4E+00

Total Risk Across All Media and All Exposure Routes	3.2E-05

Total Blood HI =	3.4E+00
Total Skin HI =	7.3E-02
Total Lifetme HI =	3.4E+00
Total Immune System HI =	1.9E+00
Total Liver HI =	3.5E-03

000122

Table9ChildRecrSite6SurfSoilRMEIND.xls

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SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-2
OU2 RECORD OF DECISION
SITE 6 RELATED RISK TABLES FROM 2000 HHRA
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TABLE B.1-9.6. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FUTURE ADULT RESIDENT
SITE 6 - SURFACE SOIL
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Entire Site 6	Benzo(a)anthracene	2.6E-06		1.4E-05	4.2E-05	Benzo(a)anthracene					
			Benzo(a)pyrene	2.4E-05		1.2E-05	3.6E-05	Benzo(a)pyrene					
			Benzo(b)fluoranthene	2.5E-06		1.3E-06	3.8E-06	Benzo(b)fluoranthene					
			Benzo(k)fluoranthene	2.6E-07		1.4E-07	4.0E-07	Benzo(k)fluoranthene					
			Dibenzo(a,h)anthracene	5.6E-07		2.9E-07	8.5E-07	Dibenzo(a,h)anthracene					
			Indeno(1,2,3-cd)pyrene	8.4E-07		4.3E-07	1.3E-06	Indeno(1,2,3-cd)pyrene					
			Benzo(g,h,i)perylene					Benzo(g,h,i)perylene	Body Weight	1.7E-04		8.7E-05	2.5E-04
			Phenanthrene					Phenanthrene	Body Weight	3.2E-04		1.7E-04	4.9E-04
			Bis(2-ethylhexyl)phthalate	2.0E-07			2.0E-07	Bis(2-ethylhexyl)phthalate		2.1E-03			2.1E-03
			Aldrin	1.7E-07			1.7E-07	Aldrin	Liver	9.6E-04			9.6E-04
			Aroclor-1242	1.2E-07		6.9E-08	1.9E-07	Aroclor-1242					
			Aroclor-1248	9.3E-07		5.2E-07	1.4E-06	Aroclor-1248					
			Aroclor-1254	8.9E-06		5.0E-06	1.4E-05	Aroclor-1254	mmunological, Nail	6.5E-01		3.6E-01	1.0E+00
			Aroclor-1260	7.2E-07		4.0E-07	1.1E-06	Aroclor-1260					
			Dieldrin	5.9E-07			5.9E-07	Dieldrin	Liver	2.1E-03			2.1E-03
			Antimony					Antimony	Longevity/Blood	2.1E+00			2.1E+00
			Arsenic	5.9E-06		7.1E-07	6.6E-06	Arsenic	Skin	3.8E-02		4.6E-03	4.3E-02
			Barium					Barium	Blood Pressure	3.2E-03			3.2E-03
			Beryllium					Beryllium	Gastrointestinal	9.8E-04			9.8E-04
			Cadmium					Cadmium	Kidney	4.0E-03		3.2E-03	7.1E-03
			Chromium		2.2E-08		2.2E-08	Chromium	NOAEL	2.0E-02	5.1E-05		2.1E-02
			Lead					Lead					
			Manganese					Manganese	CNS	6.1E-03			6.1E-03
			Mercury					Mercury	Autoimmune System	9.4E-03			9.4E-03
			Nickel					Nickel	Decreased body / organ weights	1.3E-02			1.3E-02
			Thallium					Thallium		6.7E-03			6.7E-03
			Vanadium					Vanadium	Lifetime	3.5E-03			3.5E-03
			Zinc					Zinc	Blood	8.9E-03			8.9E-03
						Total Risk Across Surface Soil	7.1E-05					Total Hazard Index Across All Media and All Exposure Routes	3.2E+00

Total Risk Across All Media and All Exposure Routes: 7.1E-05

Total Body Weight HI =	3.9E-03
Total CNS HI =	6.1E-03
Total Blood HI =	2.1E+00
Total Skin HI =	4.3E-02
Total Lifetime HI =	2.1E+00
Total Immune System HI =	1.0E+00
Total Blood Pressure HI =	3.2E-03
Total Blood Kidney HI =	7.1E-03
Total Gastrointestinal HI =	9.8E-04

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Table9AdultResSite6SurfSoilRME.xls

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-2
OU2 RECORD OF DECISION
SITE 6 RELATED RISK TABLES FROM 2000 HHRA
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TABLE 8.1-9-6. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CHILD RESIDENT
SITE 6 - SURFACE SOIL
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child (0-6 Years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Entire Site 6	Benzo(a)anthracene	6.5E-06		2.5E-06	9.0E-06	Benzo(a)anthracene					
			Benzo(a)pyrene	5.5E-05		2.1E-05	7.6E-05	Benzo(a)pyrene					
			Benzo(b)fluoranthene	5.8E-06		2.2E-06	8.0E-06	Benzo(b)fluoranthene					
			Benzo(k)fluoranthene	6.2E-07		2.3E-07	8.5E-07	Benzo(k)fluoranthene					
			Dibenzo(a,h)anthracene	1.3E-06		4.9E-07	1.8E-06	Dibenzo(a,h)anthracene					
			Indeno(1,2,3-cd)pyrene	2.0E-06		7.4E-07	2.7E-06	Indeno(1,2,3-cd)pyrene					
			Benzo(g,h,i)perylene					Benzo(g,h,i)perylene	Body Weight	1.6E-03		5.9E-04	2.2E-03
			Phenanthrene					Phenanthrene	Body Weight	3.0E-03		1.1E-03	4.1E-03
			Bis(2-ethylhexyl)phthalate	4.7E-07			4.7E-07	Bis(2-ethylhexyl)phthalate		1.9E-02			1.9E-02
			Aldrin	3.9E-07			3.9E-07	Aldrin	Liver	9.0E-03			9.0E-03
			Aroclor-1242	2.9E-07		1.2E-07	4.0E-07	Aroclor-1242					
			Aroclor-1248	2.2E-06		8.8E-07	3.0E-06	Aroclor-1248					
			Aroclor-1254	2.1E-05		8.5E-06	2.9E-05	Aroclor-1254	Immunological, Nails	6.1E+00		2.5E+00	8.6E+00
			Aroclor-1260	1.7E-06		6.9E-07	2.4E-06	Aroclor-1260					
			Dieldrin	1.4E-06			1.4E-06	Dieldrin	Liver	2.0E-02			2.0E-02
			Antimony					Antimony	Longevity/Blood	2.0E+01			2.0E+01
			Arsenic	1.4E-05		1.2E-06	1.5E-05	Arsenic	Skin	3.8E-01		3.1E-02	3.9E-01
			Barium					Barium	Blood Pressure	3.0E-02			3.0E-02
			Beryllium					Beryllium	Gastrointestinal	9.2E-03			9.2E-03
			Cadmium					Cadmium	Kidney	3.7E-02		2.2E-02	5.9E-02
			Chromium		2.5E-08			Chromium	NOAEL	1.9E-01	2.4E-04		1.9E-01
			Lead					Lead					
			Manganese					Manganese	CNS	5.7E-02			5.7E-02
			Mercury					Mercury	Autoimmune System	8.7E-02			8.7E-02
			Nickel					Nickel	Decreased body / organ weights	1.2E-01			1.2E-01
			Thallium					Thallium		6.2E-02			6.2E-02
			Vanadium					Vanadium	Lifetime	3.2E-02			3.2E-02
			Zinc					Zinc	Blood	8.3E-02			8.3E-02
						Total Risk Across Surface Soil	1.5E-04					Total Hazard Index Across All Media and All Exposure Routes	2.9E+01

Total Risk Across All Media and All Exposure Routes: 1.5E-04

Total Body Weight HI =	3.6E-02
Total CNS HI =	5.7E-02
Total Blood HI =	2.0E+01
Total Skin HI =	3.9E-01
Total Lifetime HI =	2.0E+01
Total Immune System HI =	8.6E+00
Total Blood Pressure HI =	3.0E-02
Total Blood Kidney HI =	5.9E-02
Total Gastrointestinal HI =	9.2E-03

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Table9ChildResSite6SurfSoilRME.xls

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SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-3
OU2 RECORD OF DECISION
SITE 29 RELATED RISK TABLES FROM 2000 HHRA
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TABLE B.3-3.1
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY FOR RESIDENTIAL EXPOSURES - SURFACE SOIL (0 - 2 feet)
SITE 29
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Entire Site 29

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)anthracene	mg/kg	9.49E-01	2.37E+00	8.60E+00		mg/kg	2.79E+00	95% UCL-T	W - Test (3)	2.79E+00	95% UCL-T	W - Test (3)
Benzo(a)pyrene	mg/kg	8.85E-01	2.19E+00	8.10E+00	J	mg/kg	2.57E+00	95% UCL-T	W - Test (3)	2.57E+00	95% UCL-T	W - Test (3)
Benzo(b)fluoranthene	mg/kg	9.17E-01	2.31E+00	8.60E+00	J	mg/kg	5.13E+00	95% UCL-T	W - Test (3)	5.13E+00	95% UCL-T	W - Test (3)
Dibenzo(a,h)anthracene	mg/kg	3.26E-01	6.31E-01	2.00E+00	J	mg/kg	9.79E-01	95% UCL-T	W - Test (3)	9.79E-01	95% UCL-T	W - Test (3)
Indeno(1,2,3-cd)pyrene	mg/kg	6.39E-01	1.57E+00	5.80E+00	J	mg/kg	2.89E+00	95% UCL-T	W - Test (3)	2.89E+00	95% UCL-T	W - Test (3)
Phenanthrene	mg/kg	1.58E+00	4.19E+00	1.60E+01		mg/kg	9.20E+00	95% UCL-T	W - Test (3)	9.20E+00	95% UCL-T	W - Test (3)
Aroclor-1248	mg/kg	1.14E-01	2.30E-01	1.10E+00		mg/kg	1.94E-01	95% UCL-T	W - Test (3)	1.94E-01	95% UCL-T	W - Test (3)
Aroclor-1254	mg/kg	1.82E-01	3.51E-01	1.60E+00		mg/kg	5.11E-01	95% UCL-T	W - Test (3)	5.11E-01	95% UCL-T	W - Test (3)
Aroclor-1260	mg/kg	1.90E-01	2.80E-01	7.60E-01		mg/kg	5.55E-01	95% UCL-T	W - Test (2)	5.55E-01	95% UCL-T	W - Test (2)
Antimony	mg/kg	8.14E+00	1.50E+01	4.91E+01	J	mg/kg	2.90E+01	95% UCL-T	W - Test (2)	2.90E+01	95% UCL-T	W - Test (2)
Arsenic	mg/kg	9.93E+00	1.19E+01	2.01E+01		mg/kg	1.19E+01	95% UCL-N	W - Test (1)	1.19E+01	95% UCL-N	W - Test (1)
Cadmium	mg/kg	2.03E+00	3.20E+00	1.11E+01		mg/kg	7.00E+00	95% UCL-T	W - Test (2)	7.00E+00	95% UCL-T	W - Test (2)
Chromium	mg/kg	4.20E+01	5.76E+01	1.28E+02		mg/kg	6.94E+01	95% UCL-T	W - Test (2)	6.94E+01	95% UCL-T	W - Test (2)
Lead	mg/kg	6.94E+02	1.20E+03	3.49E+03		mg/kg	6.94E+02	Average	NA	NA	NA	NA
Manganese	mg/kg	2.87E+02	4.10E+02	8.46E+02		mg/kg	4.35E+02	95% UCL-T	W - Test (2)	4.35E+02	95% UCL-T	W - Test (2)
Nickel	mg/kg	4.12E+02	9.52E+02	4.97E+03	J	mg/kg	1.62E+03	95% UCL-T	W - Test (3)	1.62E+03	95% UCL-T	W - Test (3)
Vanadium	mg/kg	4.25E+01	7.84E+01	2.40E+02		mg/kg	6.57E+01	95% UCL-T	W - Test (3)	6.57E+01	95% UCL-T	W - Test (3)
Zinc	mg/kg	4.75E+02	7.86E+02	2.90E+03	J	mg/kg	1.95E+03	95% UCL-T	W - Test (2)	1.95E+03	95% UCL-T	W - Test (2)
2378-TCDD EQUIVALENT	mg/kg		NA	1.21E-04		mg/kg	1.21E-04	Maximum	N < 10 (5)	1.21E-04	Maximum	N < 10 (5)
BAP EQUIVALENT	mg/kg	1.26E+00	3.29E+00	1.25E+01		mg/kg	1.25E+01	Maximum	W - Test (4a)	1.25E+01	Maximum	W - Test (4a)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test indicates data are normally distributed.
(2) Shapiro-Wilk W Test indicates data are log-normally distributed.
(3) Shapiro-Wilk W Test is inconclusive. Best fit is a log-normal distribution.
(4) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration is used for the RME and CTE.
(4a) Best fit is a log-normal distribution. See Table B.3-3.1A for statistical summary.
(5) Dataset consists of less than 10 samples. Therefore, maximum concentration is used for the RME and CTE.

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-3
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SITE 29 RELATED RISK TABLES FROM 2000 HHRA
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TABLE B.3-3.2
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY FOR INDUSTRIAL EXPOSURES - SURFACE SOIL (0 - 2 feet)
SITE 29
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current / Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Entire Site 29

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)anthracene	mg/kg	9.49E-01	2.37E+00	8.80E+00		mg/kg	2.79E+00	95% UCL-T	W - Test (3)	2.79E+00	95% UCL-T	W - Test (3)
Benzo(a)pyrene	mg/kg	8.85E-01	2.19E+00	8.10E+00	J	mg/kg	2.57E+00	95% UCL-T	W - Test (3)	2.57E+00	95% UCL-T	W - Test (3)
Benzo(b)fluoranthene	mg/kg	9.17E-01	2.31E+00	8.60E+00	J	mg/kg	5.13E+00	95% UCL-T	W - Test (3)	5.13E+00	95% UCL-T	W - Test (3)
Dibenzo(a,h)anthracene	mg/kg	3.26E-01	6.31E-01	2.00E+00	J	mg/kg	9.79E-01	95% UCL-T	W - Test (3)	9.79E-01	95% UCL-T	W - Test (3)
Indeno(1,2,3-cd)pyrene	mg/kg	6.39E-01	1.57E+00	5.80E+00	J	mg/kg	2.89E+00	95% UCL-T	W - Test (3)	2.89E+00	95% UCL-T	W - Test (3)
Aroclor-1248	mg/kg	1.14E-01	2.30E-01	1.10E+00		mg/kg	1.94E-01	95% UCL-T	W - Test (3)	1.94E-01	95% UCL-T	W - Test (3)
Aroclor-1254	mg/kg	1.82E-01	3.51E-01	1.60E+00		mg/kg	5.11E-01	95% UCL-T	W - Test (3)	5.11E-01	95% UCL-T	W - Test (3)
Arsenic	mg/kg	9.93E+00	1.19E+01	2.01E+01		mg/kg	1.19E+01	95% UCL-N	W - Test (1)	1.19E+01	95% UCL-N	W - Test (1)
Chromium	mg/kg	4.20E+01	5.76E+01	1.28E+02		mg/kg	6.94E+01	95% UCL-T	W - Test (2)	6.94E+01	95% UCL-T	W - Test (2)
Lead	mg/kg	6.94E+02	1.20E+03	3.49E+03		mg/kg	6.94E+02	Average	NA	NA	NA	NA
Nickel	mg/kg	4.12E+02	9.52E+02	4.97E+03	J	mg/kg	1.62E+03	95% UCL-T	W - Test (3)	1.62E+03	95% UCL-T	W - Test (3)
2378-TCDD EQUIVALENT	mg/kg		NA	1.21E-04		mg/kg	1.21E-04	Maximum	N < 10 (5)	1.21E-04	Maximum	N < 10 (5)
BAP EQUIVALENT	mg/kg	1.26E+00	3.29E+00	1.25E+01		mg/kg	1.25E+01	Maximum	W - Test (4a)	1.25E+01	Maximum	W - Test (4a)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test indicates data are normally distributed.
(2) Shapiro-Wilk W Test indicates data are log-normally distributed.
(3) Shapiro-Wilk W Test is inconclusive. Best fit is a log-normal distribution.
(4) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration is used for the RME and CTE.
(4a) Best fit is a log-normal distribution. See Table B.3-3.1A for statistical summary.
(5) Dataset consists of less than 10 samples. Therefore, maximum concentration is used for the RME and CTE.

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

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SITE 29 RELATED RISK TABLES FROM 2000 HHRA
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TABLE B.3-3.3
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY FOR RESIDENTIAL EXPOSURES - SURFACE AND SUBSURFACE SOIL (0 - 10 feet)
SITE 29
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface and Subsurface Soil
Exposure Point: Entire Site 29

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)anthracene	mg/kg	1.01E+00	1.66E+00	8.80E+00		mg/kg	1.96E+00	95% UCL-T	W - Test (2)	1.96E+00	95% UCL-T	W - Test (2)
Benzo(a)pyrene	mg/kg	9.59E-01	1.58E+00	8.30E+00	J	mg/kg	1.71E+00	95% UCL-T	W - Test (2)	1.71E+00	95% UCL-T	W - Test (2)
Benzo(b)fluoranthene	mg/kg	9.69E-01	1.56E+00	8.60E+00	J	mg/kg	2.16E+00	95% UCL-T	W - Test (1)	2.16E+00	95% UCL-T	W - Test (1)
Dibenzo(a,h)anthracene	mg/kg	3.12E-01	4.34E-01	2.00E+00	J	mg/kg	4.18E-01	95% UCL-T	W - Test (2)	4.18E-01	95% UCL-T	W - Test (2)
Indeno(1,2,3-cd)pyrene	mg/kg	5.91E-01	9.48E-01	5.80E+00	J	mg/kg	1.11E+00	95% UCL-T	W - Test (2)	1.11E+00	95% UCL-T	W - Test (2)
Phenanthrene	mg/kg	1.34E+00	2.31E+00	1.60E+01		mg/kg	2.90E+00	95% UCL-T	W - Test (2)	2.90E+00	95% UCL-T	W - Test (2)
Aroclor-1248	mg/kg	3.63E-01	7.40E-01	7.30E+00		mg/kg	4.38E-01	95% UCL-T	W - Test (2)	4.38E-01	95% UCL-T	W - Test (2)
Aroclor-1254	mg/kg	4.07E-01	7.89E-01	6.60E+00		mg/kg	4.69E-01	95% UCL-T	W - Test (2)	4.69E-01	95% UCL-T	W - Test (2)
Aroclor-1260	mg/kg	8.07E-01	1.35E+00	8.40E+00	J	mg/kg	2.46E+00	95% UCL-T	W - Test (1)	2.46E+00	95% UCL-T	W - Test (1)
Antimony	mg/kg	2.15E+02	5.38E+02	5.72E+03		mg/kg	4.86E+02	95% UCL-T	W - Test (1)	4.86E+02	95% UCL-T	W - Test (1)
Arsenic	mg/kg	1.22E+01	1.40E+01	3.80E+01		mg/kg	1.40E+01	95% UCL-T	W - Test (3)	1.40E+01	95% UCL-T	W - Test (3)
Barium	mg/kg	1.47E+02	1.94E+02	7.10E+02		mg/kg	2.15E+02	95% UCL-T	W - Test (1)	2.15E+02	95% UCL-T	W - Test (1)
Cadmium	mg/kg	5.79E+00	9.09E+00	5.27E+01		mg/kg	1.88E+01	95% UCL-T	W - Test (1)	1.88E+01	95% UCL-T	W - Test (1)
Chromium	mg/kg	8.48E+01	1.12E+02	5.27E+02		mg/kg	1.22E+02	95% UCL-T	W - Test (1)	1.22E+02	95% UCL-T	W - Test (1)
Lead	mg/kg	4.47E+03	9.73E+03	1.16E+05		mg/kg	4.47E+03	Average	NA	NA	NA	NA
Manganese	mg/kg	6.32E+02	7.89E+02	1.91E+03	J	mg/kg	9.01E+02	95% UCL-T	W - Test (1)	9.01E+02	95% UCL-T	W - Test (1)
Mercury	mg/kg	6.94E-01	1.11E+00	8.40E+00		mg/kg	2.48E+00	95% UCL-T	W - Test (1)	2.48E+00	95% UCL-T	W - Test (1)
Nickel	mg/kg	5.44E+02	8.46E+02	4.97E+03	J	mg/kg	1.70E+03	95% UCL-T	W - Test (1)	1.70E+03	95% UCL-T	W - Test (1)
Silver	mg/kg	7.00E+00	1.08E+01	6.00E+01		mg/kg	2.86E+01	95% UCL-T	W - Test (1)	2.86E+01	95% UCL-T	W - Test (1)
Thallium	mg/kg	5.80E-01	9.03E-01	6.60E+00		mg/kg	6.82E-01	95% UCL-T	W - Test (2)	6.82E-01	95% UCL-T	W - Test (2)
Vanadium	mg/kg	4.57E+01	6.25E+01	2.50E+02		mg/kg	5.45E+01	95% UCL-T	W - Test (2)	5.45E+01	95% UCL-T	W - Test (2)
Zinc	mg/kg	1.16E+03	1.70E+03	1.06E+04	J	mg/kg	3.78E+03	95% UCL-T	W - Test (1)	3.78E+03	95% UCL-T	W - Test (1)
2378-TCDD EQUIVALENT	mg/kg	2.99E-04	4.88E-04	2.60E-03		mg/kg	2.60E-03	Maximum	W - Test (4a)	2.60E-03	Maximum	W - Test (4a)
BAP EQUIVALENT	mg/kg	1.40E+00	2.31E+00	1.25E+01		mg/kg	5.06E+00	95% UCL-T	W - Test (1)	5.06E+00	95% UCL-T	W - Test (1)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.
(2) Shapiro-Wilk W Test is inconclusive. Best fit is a log-normal distribution.
(3) Shapiro-Wilk W Test is inconclusive. Best fit is a normal distribution.
(4) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration is used for the RME and CTE.
(4a) Data are log-normally distributed. See Table B.3-3.3A for statistical summary.

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Table3ALLSoilSite29F.xls 3/22/00 11:19 AM

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

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SITE 29 RELATED RISK TABLES FROM 2000 HHRA
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TABLE B.3-3.4
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY FOR COMMERCIAL / INDUSTRIAL EXPOSURES- SURFACE AND SUBSURFACE SOIL (0 - 10 feet)
SITE 29
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current / Future
Medium: Soil
Exposure Medium: Surface and Subsurface Soil
Exposure Point: Entire Site 29

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)anthracene	mg/kg	1.01E+00	1.66E+00	8.80E+00		mg/kg	1.96E+00	95% UCL-T	W - Test (2)	1.96E+00	95% UCL-T	W - Test (2)
Benzo(a)pyrene	mg/kg	9.59E-01	1.58E+00	8.30E+00	J	mg/kg	1.71E+00	95% UCL-T	W - Test (2)	1.71E+00	95% UCL-T	W - Test (2)
Benzo(b)fluoranthene	mg/kg	9.69E-01	1.56E+00	8.60E+00	J	mg/kg	2.16E+00	95% UCL-T	W - Test (1)	2.16E+00	95% UCL-T	W - Test (1)
Dibenzo(a,h)anthracene	mg/kg	3.12E-01	4.34E-01	2.00E+00	J	mg/kg	4.18E-01	95% UCL-T	W - Test (2)	4.18E-01	95% UCL-T	W - Test (2)
Indeno(1,2,3-cd)pyrene	mg/kg	5.91E-01	9.48E-01	5.80E+00		mg/kg	1.11E+00	95% UCL-T	W - Test (2)	1.11E+00	95% UCL-T	W - Test (2)
Aroclor-1248	mg/kg	3.63E-01	7.40E-01	7.30E+00		mg/kg	4.38E-01	95% UCL-T	W - Test (2)	4.38E-01	95% UCL-T	W - Test (2)
Aroclor-1254	mg/kg	4.07E-01	7.89E-01	6.60E+00		mg/kg	4.69E-01	95% UCL-T	W - Test (2)	4.69E-01	95% UCL-T	W - Test (2)
Aroclor-1260	mg/kg	8.07E-01	1.35E+00	8.40E+00	J	mg/kg	2.46E+00	95% UCL-T	W - Test (1)	2.46E+00	95% UCL-T	W - Test (1)
Antimony	mg/kg	2.15E+02	5.38E+02	5.72E+03		mg/kg	4.86E+02	95% UCL-T	W - Test (1)	4.86E+02	95% UCL-T	W - Test (1)
Arsenic	mg/kg	1.22E+01	1.40E+01	3.80E+01		mg/kg	1.40E+01	95% UCL-N	W - Test (3)	1.40E+01	95% UCL-N	W - Test (3)
Chromium	mg/kg	8.48E+01	1.12E+02	5.27E+02		mg/kg	1.22E+02	95% UCL-T	W - Test (1)	1.22E+02	95% UCL-T	W - Test (1)
Lead	mg/kg	4.47E+03	9.73E+03	1.16E+05		mg/kg	4.47E+03	Average	NA	NA	NA	NA
Nickel	mg/kg	5.44E+02	8.46E+02	4.97E+03	J	mg/kg	1.70E+03	95% UCL-T	W - Test (1)	1.70E+03	95% UCL-T	W - Test (1)
2378-TCDD EQUIVALENT	mg/kg	2.99E-04	4.88E-04	2.60E-03		mg/kg	2.60E-03	Maximum	W - Test (4a)	2.60E-03	Maximum	W - Test (4a)
BAP EQUIVALENT	mg/kg	1.40E+00	2.31E+00	1.25E+01		mg/kg	5.06E+00	95% UCL-T	W - Test (1)	5.06E+00	95% UCL-T	W - Test (1)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.
(2) Shapiro-Wilk W Test is inconclusive. Best fit is a log-normal distribution.
(3) Shapiro-Wilk W Test is inconclusive. Best fit is a normal distribution.
(4) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration is used for the RME and CTE.
(4a) Data are log-normally distributed. See Table B.3-3.3A for statistical summary.

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

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TABLE B.3-9.1. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKER
SITE 29 - ALL SOIL
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Entire Site 29	Benzo(a)anthracene	5.8E-08		1.2E-08	6.9E-08	Benzo(a)anthracene					
			Benzo(a)pyrene	5.0E-07		1.0E-07	6.0E-07	Benzo(a)pyrene					
			Benzo(b)fluoranthene	6.3E-08		1.3E-08	7.6E-08	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	1.2E-07		2.5E-08	1.5E-07	Dibenzo(a,h)anthracene					
			Indeno(1,2,3-cd)pyrene	3.2E-08		6.6E-09	3.9E-08	Indeno(1,2,3-cd)pyrene					
			Aroclor-1248	3.5E-08		7.7E-09	4.3E-08	Aroclor-1248					
			Aroclor-1254	3.8E-08		8.3E-09	4.6E-08	Aroclor-1254	mmunological, Nails	6.6E-02		1.4E-02	8.0E-02
			Aroclor-1260	2.0E-07		4.3E-08	2.4E-07	Aroclor-1260					
			Antimony					Antimony	Longevity/Blood	3.4E+00			3.4E+00
			Arsenic	8.4E-07		4.0E-08	8.8E-07	Arsenic	Skin	1.3E-01		6.2E-03	1.4E-01
			Chromium		1.4E-09		1.4E-09	Chromium	NOAEL	1.1E-01	7.9E-05		1.1E-01
			Lead					Lead					
			Nickel					Nickel	Decreased body / organ weights	2.4E-01			2.4E-01
			2378-TCDD EQUIVALENT	1.6E-05	1.1E-10	7.4E-07	1.6E-05	2378-TCDD EQUIVALENT					
Groundwater	Water	Entire OU2	Antimony					Antimony	Longevity/Blood			5.4E-02	5.4E-02
			Arsenic				3.2E-07	Arsenic	Skin			2.8E-02	2.8E-02
			Chromium					Chromium	NOAEL			3.9E-02	3.9E-02
			Lead					Lead					
			Manganese					Manganese	CNS			5.0E-01	5.0E-01
			Nickel					Nickel	Decreased body / organ weights			1.9E-02	1.9E-02

Total Risk Across Soil	1.9E-05
Total Risk Across Groundwater	3.2E-07
Total Risk Across All Media and All Exposure Routes	1.9E-05

Total Hazard Index Across All Media and All Exposure Routes: 4.6E+00

Total Body Weight HI =	2.6E-01
Total CNS HI =	5.0E-01
Total Blood HI =	3.5E+00
Total Skin HI =	1.7E-01
Total Lifetme HI =	3.5E+00
Total Immune System HI =	8.0E-02

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Table9ConstWSite29ALLSoilRMEIND.xls 3/22/00 1:42 PM

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

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TABLE B.3-9.2. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - COMMERCIAL WORKER
SITE 29
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current / Future
Receptor Population: Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Entire Site 29	Benzo(a)anthracene	4.3E-07		2.8E-07	7.0E-07	Benzo(a)anthracene					
			Benzo(a)pyrene	3.9E-06		2.6E-06	6.5E-06	Benzo(a)pyrene					
			Benzo(b)fluoranthene	7.9E-07		5.1E-07	1.3E-06	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	1.5E-06		9.7E-07	2.5E-06	Dibenzo(a,h)anthracene					
			Indeno(1,2,3-cd)pyrene	4.4E-07		2.9E-07	7.3E-07	Indeno(1,2,3-cd)pyrene					
			Aroclor-1248	8.1E-08		5.7E-08	1.4E-07	Aroclor-1248					
			Aroclor-1254	2.1E-07		1.5E-07	3.6E-07	Aroclor-1254	Immunological, Nails	1.5E-02		1.1E-02	2.6E-02
			Arsenic	3.7E-06		5.6E-07	4.3E-06	Arsenic	Skin	2.3E-02		3.5E-03	2.7E-02
			Chromium		1.5E-08		1.5E-08	Chromium	NOAEL	1.4E-02	3.4E-05	2.7E-02	4.1E-02
			Lead					Lead					
			Nickel					Nickel	Decreased body / organ weights	4.8E-02			4.8E-02
			2378-TCDD EQUIVALENT	3.8E-06	9.6E-11	5.7E-07	4.4E-06	2378-TCDD EQUIVALENT					
							Total Risk Across Surface Soil	2.1E-05					Total Hazard Index Across All Media and All Exposure Routes	1.4E-01

Total Risk Across All Media and All Exposure Routes 2.1E-05

Total Body Weight HI = 4.8E-02
Total Skin HI = 2.7E-02
Total Immune System HI = 2.6E-02

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

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SITE 29 RELATED RISK TABLES FROM 2000 HHRA
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TABLE B.3-9.3. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADULT RECREATIONAL USER
SITE 29
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Recrereational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Entire Site 29	Benzo(a)anthracene	7.1E-08		7.4E-08	1.4E-07	Benzo(a)anthracene					
			Benzo(a)pyrene	6.5E-07		6.8E-07	1.3E-06	Benzo(a)pyrene					
			Benzo(b)fluoranthene	1.3E-07		1.4E-07	2.7E-07	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	2.5E-07		2.6E-07	5.1E-07	Dibenzo(a,h)anthracene					
			Indeno(1,2,3-cd)pyrene	7.4E-08		7.6E-08	1.5E-07	Indeno(1,2,3-cd)pyrene					
			Aroclor-1248	1.4E-08		1.5E-08	2.9E-08	Aroclor-1248					
			Aroclor-1254	3.6E-08		4.0E-08	7.6E-08	Aroclor-1254	mmunological, Nails	2.6E-03		2.9E-03	5.5E-03
			Arsenic	6.2E-07		1.5E-07	7.7E-07	Arsenic	Skin	4.0E-03		9.6E-04	5.0E-03
			Chromium		1.2E-09		1.2E-09	Chromium	NOAEL	2.4E-03	2.8E-06	7.5E-03	9.9E-03
			Lead					Lead					
			Nickel					Nickel	Decreased body / organ weights	8.2E-03			8.2E-03
			2378-TCDD EQUIVALENT	6.3E-07	7.6E-12	1.5E-07	7.8E-07	2378-TCDD EQUIVALENT					
						Total Risk Across Surface Soil	4.1E-06					Total Hazard Index Across All Media and All Exposure Routes	2.9E-02

Total Risk Across All Media and All Exposure Routes: 4.1E-06

Total Body Weight HI = 8.2E-03
Total Skin HI = 5.0E-03
Total Immune System HI = 5.5E-03

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Table9AdultRecrSite29SurfSoilRMEIND.xls

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SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

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TABLE B.3-9.4. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CHILD RECREATIONAL USER
SITE 29
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Recrereational User
Receptor Age: Child (0-6 Years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Entire Site 29	Benzo(a)anthracene	1.7E-07		1.2E-07	2.9E-07	Benzo(a)anthracene					
			Benzo(a)pyrene	1.5E-06		1.2E-06	2.7E-06	Benzo(a)pyrene					
			Benzo(b)fluoranthene	3.0E-07		2.3E-07	5.3E-07	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	5.8E-07		4.4E-07	1.0E-06	Dibenzo(a,h)anthracene					
			Indeno(1,2,3-cd)pyrene	1.7E-07		1.3E-07	3.0E-07	Indeno(1,2,3-cd)pyrene					
			Aroclor-1248	3.2E-08		2.6E-08	5.7E-08	Aroclor-1248					
			Aroclor-1254	8.3E-08		6.8E-08	1.5E-07	Aroclor-1254	mmunological, Nails	2.4E-02		2.0E-02	4.4E-02
			Arsenic	1.5E-06		2.5E-07	1.7E-06	Arsenic	Skin	3.8E-02		6.5E-03	4.4E-02
			Chromium		9.0E-10		9.0E-10	Chromium	NOAEL	2.2E-02	8.6E-06	5.1E-02	7.3E-02
			Lead					Lead					
			Nickel					Nickel	Decreased body / organ weights	7.7E-02			7.7E-02
			2378-TCDD EQUIVALENT	1.5E-06	5.8E-12	2.6E-07	1.7E-06	2378-TCDD EQUIVALENT					
			Total Risk Across Surface Soil				8.5E-06	Total Hazard Index Across All Media and All Exposure Routes					2.4E-01

Total Risk Across All Media and All Exposure Routes: 8.5E-06

Total Body Weight HI = 7.7E-02
Total Skin HI = 4.4E-02
Total Immune System HI = 4.4E-02

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Table9ChildRecrSite29SurfSoilRMEIND.xls

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SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

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SITE 29 RELATED RISK TABLES FROM 2000 HHRA
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TABLE B.3-9.5. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADULT RESIDENT
SITE 29
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Entire Site 29	Benzo(a)anthracene	4.1E-07		2.1E-07	6.2E-07	Benzo(a)anthracene					
			Benzo(a)pyrene	3.8E-06		2.0E-06	5.7E-06	Benzo(a)pyrene					
			Benzo(b)fluoranthene	7.5E-07		3.9E-07	1.1E-06	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	1.4E-06		7.5E-07	2.2E-06	Dibenzo(a,h)anthracene					
			Indeno(1,2,3-cd)pyrene	4.3E-07		2.2E-07	6.5E-07	Indeno(1,2,3-cd)pyrene					
			Phenanthrene					Phenanthrene	Body Weight	2.7E-04		1.4E-04	4.1E-04
			Aroclor-1248	7.8E-08		4.4E-08	1.2E-07	Aroclor-1248					
			Aroclor-1254	2.1E-07		1.1E-07	3.2E-07	Aroclor-1254	Immunological, Nails	1.5E-02		8.4E-03	2.3E-02
			Aroclor-1260	2.2E-07		1.2E-07	3.5E-07	Aroclor-1260					
			Antimony					Antimony	Longevity/Blood	4.3E-02			4.3E-02
			Arsenic	3.6E-06		4.3E-07	4.0E-06	Arsenic	Skin	2.3E-02		2.8E-03	2.6E-02
			Cadmium					Cadmium	Kidney	4.1E-03			4.1E-03
			Chromium		1.4E-08		1.4E-08	Chromium	NOAEL	1.4E-02	3.4E-05	2.2E-02	3.5E-02
			Lead					Lead					
			Manganese					Manganese	CNS	3.7E-03			3.7E-03
			Nickel					Nickel	Decreased body / organ weights	4.8E-02			4.8E-02
			Vanadium					Vanadium	Lifetime	5.5E-03			5.5E-03
			Zinc					Zinc	Blood	3.8E-03			3.8E-03
			2378-TCDD EQUIVALENT	3.7E-06	9.2E-11	4.4E-07	4.1E-06	2378-TCDD EQUIVALENT					
			BAP EQUIVALENT					BAP EQUIVALENT					
							Total Risk Across Surface Soil	1.9E-05					Total Hazard Index Across All Media and All Exposure Routes	1.9E-01

Total Risk Across All Media and All Exposure Routes 1.9E-05

Total Body Weight HI =	4.8E-02
Total CNS HI =	3.7E-03
Total Blood HI =	4.6E-02
Total Skin HI =	2.6E-02
Total Lifetime HI =	4.8E-02
Total Immune System HI =	2.3E-02

000280

Table9AdultResSite29SurfSoilRME.xls 8/25/00 9:18 AM

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-3
OU2 RECORD OF DECISION
SITE 29 RELATED RISK TABLES FROM 2000 HHRA
PAGE 10 OF 10

TABLE B.3-9.6. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CHILD RESIDENT
SITE 29
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child (0-5 Years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Entire Site 29	Benzo(a)anthracene	9.6E-07		3.6E-07	1.3E-06	Benzo(a)anthracene					
			Benzo(a)pyrene	8.8E-06		3.3E-06	1.2E-05	Benzo(a)pyrene					
			Benzo(b)fluoranthene	1.8E-06		6.6E-07	2.4E-06	Benzo(b)fluoranthene					
			Dibenzo(a,h)anthracene	3.4E-06		1.3E-06	4.6E-06	Dibenzo(a,h)anthracene					
			Indeno(1,2,3-cd)pyrene	9.9E-07		3.7E-07	1.4E-06	Indeno(1,2,3-cd)pyrene					
			Phenanthrene					Phenanthrene	Body Weight	2.5E-03		9.5E-04	3.5E-03
			Aroclor-1248	1.8E-07		7.4E-08	2.6E-07	Aroclor-1248					
			Aroclor-1254	4.8E-07		2.0E-07	6.8E-07	Aroclor-1254	Immunological, Nails	1.4E-01		5.7E-02	2.0E-01
			Aroclor-1260	5.2E-07		2.1E-07	7.3E-07	Aroclor-1260					
			Antimony					Antimony	Longevity/Blood	4.0E-01			4.0E-01
			Arsenic	8.4E-06		7.3E-07	9.1E-06	Arsenic	Skin	2.2E-01		1.9E-02	2.4E-01
			Cadmium					Cadmium	Kidney	3.8E-02			3.8E-02
			Chromium		1.7E-08		1.7E-08	Chromium	NOAEL	1.3E-01	1.6E-04	1.5E-01	2.7E-01
			Lead					Lead					
			Manganese					Manganese	CNS	3.4E-02			3.4E-02
			Nickel					Nickel	Decreased body / organ weights	4.4E-01			4.4E-01
			Vanadium					Vanadium	Lifetime	5.1E-02			5.1E-02
			Zinc					Zinc	Blood	3.6E-02			3.6E-02
			2378-TCDD EQUIVALENT	8.5E-06	1.1E-10	7.4E-07	9.3E-06	2378-TCDD EQUIVALENT					
			BAP EQUIVALENT					BAP EQUIVALENT					
						Total Risk Across Surface Soil	4.2E-05					Total Hazard Index Across All Media and All Exposure Routes	1.7E+00

Total Risk Across All Media and All Exposure Routes 4.2E-05

Total Body Weight HI =	4.5E-01
Total CNS HI =	3.4E-02
Total Blood HI =	4.3E-01
Total Skin HI =	2.4E-01
Total Lifetme HI =	4.5E-01
Total Immune System HI =	2.0E-01

000282

Table9ChildResSite29SurfSoilRME.xls

3/22/00 1:44 PM

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-4
OU2 RECORD OF DECISION
DRMO IMPACT AREA RELATED RISK TABLES FROM 2000 HHRA
PAGE 1 OF 15

TABLE B.4-3.1
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY FOR RESIDENTIAL EXPOSURES - SURFACE SOIL (0-1 FOOT bgs)
DRMO IMPACT AREA
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current / Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Entire DRMO Impact Area

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)pyrene	mg/kg	1.40E-01	NA	1.40E-01	J	mg/kg	1.40E-01	Maximum	N < 10 (4)	1.40E-01	Maximum	N < 10 (4)
4,4'-DDE	mg/kg	3.57E-01	6.16E-01	2.50E+00	J	mg/kg	1.78E+00	95% UCL-T	W - Test (3)	1.78E+00	95% UCL-T	W - Test (3)
4,4'-DDT	mg/kg	4.07E-01	7.19E-01	3.00E+00	J	mg/kg	2.19E+00	95% UCL-T	W - Test (3)	2.19E+00	95% UCL-T	W - Test (3)
Antimony	mg/kg	2.43E+00	3.32E+00	8.00E+00	J	mg/kg	3.18E+00	95% UCL-T	W - Test (3)	3.18E+00	95% UCL-T	W - Test (3)
Arsenic	mg/kg	1.95E+01	2.61E+01	8.38E+01	J	mg/kg	2.43E+01	95% UCL-T	W - Test (3)	2.43E+01	95% UCL-T	W - Test (3)
Cadmium	mg/kg	1.28E+00	1.72E+00	4.20E+00		mg/kg	1.85E+00	95% UCL-T	W - Test (2)	1.85E+00	95% UCL-T	W - Test (2)
Chromium	mg/kg	4.56E+01	5.29E+01	8.13E+01		mg/kg	5.29E+01	95% UCL-N	W - Test (1)	5.29E+01	95% UCL-N	W - Test (1)
Lead	mg/kg	3.09E+02	3.99E+02	9.09E+02		mg/kg	3.09E+02	Average	NA	NA	NA	NA
Thallium	mg/kg	2.73E-01	3.46E-01	6.10E-01	J	mg/kg	3.98E-01	95% UCL-T	W - Test (2)	3.98E-01	95% UCL-T	W - Test (2)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test indicates data are normally distributed. See Table B.4-3.1A for statistical summary.
(2) Shapiro-Wilk W Test indicates data are log-normally distributed.
(3) Shapiro-Wilk W Test is inconclusive. Best fit is a log-normal distribution.
(4) Dataset consists of less than 10 samples. Therefore, maximum concentration is used for the RME and CTE.

000312

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-4
OU2 RECORD OF DECISION
DRMO IMPACT AREA RELATED RISK TABLES FROM 2000 HHRA
PAGE 2 OF 15

TABLE B.4-3.2
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY FOR COMMERCIAL / INDUSTRIAL EXPOSURES - SURFACE SOIL (0-1 FOOT bgs)
DRMO IMPACT AREA
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current / Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: Entire DRMO Impact Area

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Arsenic	mg/kg	1.95E+01	2.61E+01	8.38E+01	J	mg/kg	2.43E+01	95% UCL-T	W - Test (3)	2.43E+01	95% UCL-T	W - Test (3)
Chromium	mg/kg	4.56E+01	5.29E+01	8.13E+01		mg/kg	5.29E+01	95% UCL-N	W - Test (1)	5.29E+01	95% UCL-N	W - Test (1)
Lead	mg/kg	3.09E+02	3.99E+02	9.09E+02		mg/kg	3.09E+02	Average	NA	NA	NA	NA

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test indicates data are normally distributed. See Table B.4-3.1A for statistical summary.
(2) Shapiro-Wilk W Test indicates data are log-normally distributed.
(3) Shapiro-Wilk W Test is inconclusive. Best fit is a log-normal distribution.
(4) Dataset consists of less than 10 samples. Therefore, maximum concentration is used for the RME and CTE.

000313

Table3SurfSoilImpactAreaFIND.xls

3/22/00 11:21 AM

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-4
OU2 RECORD OF DECISION
DRMO IMPACT AREA RELATED RISK TABLES FROM 2000 HHRA
PAGE 3 OF 15

TABLE B.4-3.3
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY FOR RESIDENTIAL EXPOSURES - SURFACE SOIL (0-2 FOOT bgs)
DRMO IMPACT AREA
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current / Future
Medium: Soil
Exposure Medium: Surface Soil (0 - 2 feet bgs)
Exposure Point: Entire DRMO Impact Area

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)pyrene	mg/kg	1.36E-01	NA	1.70E-01	J	mg/kg	1.70E-01	Maximum	N < 10 (1)	1.70E-01	Maximum	N < 10 (1)
4,4'-DDE	mg/kg	2.86E-01	4.53E-01	2.50E+00	J	mg/kg	6.61E-01	95% UCL-T	W - Test (3)	6.61E-01	95% UCL-T	W - Test (3)
4,4'-DDT	mg/kg	3.02E-01	4.94E-01	3.00E+00	J	mg/kg	7.20E-01	95% UCL-T	W - Test (3)	7.20E-01	95% UCL-T	W - Test (3)
Antimony	mg/kg	3.20E+00	4.23E+00	1.15E+01	J	mg/kg	4.13E+00	95% UCL-T	W - Test (3)	4.13E+00	95% UCL-T	W - Test (3)
Arsenic	mg/kg	1.89E+01	2.32E+01	8.38E+01	J	mg/kg	2.30E+01	95% UCL-T	W - Test (3)	2.30E+01	95% UCL-T	W - Test (3)
Cadmium	mg/kg	1.29E+00	1.65E+00	4.60E+00		mg/kg	1.75E+00	95% UCL-T	W - Test (2)	1.75E+00	95% UCL-T	W - Test (2)
Chromium	mg/kg	6.19E+01	7.64E+01	2.26E+02		mg/kg	8.15E+01	95% UCL-T	W - Test (2)	8.15E+01	95% UCL-T	W - Test (2)
Lead	mg/kg	2.54E+02	3.15E+02	9.09E+02		mg/kg	2.54E+02	Average	NA	NA	NA	NA
Manganese	mg/kg	6.28E+02	NA	1.07E+03		mg/kg	1.07E+03	Maximum	N < 10 (1)	1.07E+03	Maximum	N < 10 (1)
Thallium	mg/kg	2.61E-01	3.07E-01	6.10E-01	J	mg/kg	3.30E-01	95% UCL-T	W - Test (2)	3.30E-01	95% UCL-T	W - Test (2)
Vanadium	mg/kg	7.80E+01	NA	1.41E+02		mg/kg	1.41E+02	Maximum	N < 10 (1)	1.41E+02	Maximum	N < 10 (1)
BAP EQUIVALENT	mg/kg	1.19E-01	NA	2.21E-01		mg/kg	2.21E-01	Maximum	N < 10 (1)	2.21E-01	Maximum	N < 10 (1)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

(1) Dataset consists of less than 10 samples. Therefore, maximum concentration is used for the RME and CTE.
(2) Shapiro-Wilk W Test indicates data are log-normally distributed. See Table B.4-3.3A for statistical summary.
(3) Shapiro-Wilk W Test is inconclusive. Best fit is a log-normal distribution.

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-4
OU2 RECORD OF DECISION
DRMO IMPACT AREA RELATED RISK TABLES FROM 2000 HHRA
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TABLE B.4-3.4
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY FOR COMMERCIAL / INDUSRTRIAL EXPOSURES - SURFACE AND SUBSURFACE SOIL (0-2 FOOT bgs)
DRMO IMPACT AREA
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current / Future
Medium: Soil
Exposure Medium: Surface and Subsurface Soil
Exposure Point: Entire DRMO Impact Area

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Arsenic	mg/kg	1.89E+01	2.32E+01	8.38E+01	J	mg/kg	2.30E+01	95% UCL-T	W - Test (3)	2.30E+01	95% UCL-T	W - Test (3)
Chromium	mg/kg	6.19E+01	7.64E+01	2.26E+02		mg/kg	8.15E+01	95% UCL-T	W - Test (2)	8.15E+01	95% UCL-T	W - Test (2)
Lead	mg/kg	2.54E+02	3.15E+02	9.09E+02		mg/kg	2.54E+02	Average	NA	NA	NA	NA

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

(1) Dataset consists of less than 10 samples. Therefore, maximum concentration is used for the RME and CTE.
(2) Shapiro-Wilk W Test indicates data are log-normally distributed. See Table B.4-3.3A for statistical summary.
(3) Shapiro-Wilk W Test is inconclusive. Best fit is a log-normal distribution.

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-4
OU2 RECORD OF DECISION
DRMO IMPACT AREA RELATED RISK TABLES FROM 2000 HHRA
PAGE 5 OF 15

TABLE B.4-9.1. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKER
DRMO IMPACT AREA - SOIL (0 - 2 feet bgs)
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface and Subsurface Soil	Soil	Entire DRMO Impact Area	Arsenic	1.4E-06		6.5E-08	1.5E-06	Arsenic	Skin	2.2E-01		1.0E-02	2.3E-01
			Chromium					Chromium	NOAEL	7.7E-02			7.7E-02
			Lead					Lead					
						Total Risk Across Surface Soil	1.5E-06					Total Hazard Index Across All Media and All Exposure Routes	3.0E-01

Total Skin HI = 2.3E-01

Total Risk Across All Media and All Exposure Routes 1.5E-06

000377

Table9ConstWImpactALLSoilRMEIND.xls 3/22/00 2:38 PM

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-4
OU2 RECORD OF DECISION
DRMO IMPACT AREA RELATED RISK TABLES FROM 2000 HHRA
PAGE 6 OF 15

TABLE 8.4-9.2. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - COMMERCIAL WORKER
DRMO IMPACT AREA - SURFACE SOIL (0-1 foot bgs)
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Entire DRMO Impact Area	Arsenic	7.6E-06		1.1E-06	8.8E-06	Arsenic	Skin	4.8E-02		7.1E-03	5.5E-02
			Chromium					Chromium	NOAEL	1.0E-02			1.0E-02
			Lead					Lead					
			Total Risk Across Surface Soil				8.8E-06		Total Hazard Index Across All Media and All Exposure Routes				6.5E-02

Total Skin HI = 5.5E-02

Total Risk Across All Media and All Exposure Routes 8.8E-06

000379

Table9CommercialImpactSurfSoilRMEIND.xls

3/22/00 2:37 PM

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-4
OU2 RECORD OF DECISION
DRMO IMPACT AREA RELATED RISK TABLES FROM 2000 HHRA
PAGE 7 OF 15

TABLE B.4-9.3. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADULT RECREATIONAL USER
DRMO IMPACT AREA - SURFACE SOIL (0-1 foot bgs)
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Entire DRMO Impact Area	Arsenic	1.3E-06		3.0E-07	1.6E-06	Arsenic	Skin	8.2E-03		2.0E-03	1.0E-02
			Chromium					Chromium	NOAEL	1.8E-03			1.8E-03
			Lead					Lead					
				Total Risk Across Surface Soil			1.6E-06		Total Hazard Index Across All Media and All Exposure Routes				1.2E-02
				Total Risk Across All Media and All Exposure Routes			1.6E-06		Total Skin HI =				1.0E-02

000381

Table9AdultRecrImpactSurfSoilRMEIND.xls

3/22/00 2:30 PM

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

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OU2 RECORD OF DECISION
DRMO IMPACT AREA RELATED RISK TABLES FROM 2000 HHRA
PAGE 8 OF 15

TABLE B.4-9.4. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CHILD RECREATIONAL USER
DRMO IMPACT AREA - SURFACE SOIL (0-1 foot bgs)
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Child (0-6 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Entire DRMO Impact Area	Arsenic	3.0E-06		5.2E-07	3.5E-06	Arsenic	Skin	7.7E-02		1.3E-02	9.0E-02
			Chromium					Chromium	NOAEL	1.7E-02			1.7E-02
			Lead					Lead					
			Total Risk Across Surface Soil				3.5E-06		Total Hazard Index Across All Media and All Exposure Routes				1.1E-01
												Total Skin HI =	9.0E-02
			Total Risk Across All Media and All Exposure Routes				3.5E-06						

000383

Table9ChildRecrImpactSurfSoilRMEIND.xls

3/22/00 2:34 PM

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-4
OU2 RECORD OF DECISION
DRMO IMPACT AREA RELATED RISK TABLES FROM 2000 HHRA
PAGE 9 OF 15

TABLE 8.1-9.5. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADULT RESIDENT
DRMO IMPACT AREA - SURFACE SOIL (0 - 1 foot bgs)
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Entire DRMO Impact Area	Benzo(a)pyrene	2.1E-07		1.1E-07	3.1E-07	Benzo(a)pyrene					
			4,4'-DDE	1.2E-07		1.5E-08	1.4E-07	4,4'-DDE					
			4,4'-DDT	1.5E-07		1.8E-08	1.7E-07	4,4'-DDT	Liver	2.6E-03		3.1E-04	2.9E-03
			Antimony					Antimony	Longevity/Blood	4.7E-03			4.7E-03
			Arsenic	7.3E-06		8.8E-07	8.2E-06	Arsenic	Skin	4.8E-02		5.7E-03	5.3E-02
			Cadmium					Cadmium	Kidney	1.1E-03		8.7E-04	2.0E-03
			Chromium					Chromium	NOAEL	1.0E-02			1.0E-02
			Lead					Lead					
			Thallium					Thallium		3.3E-03			3.3E-03
			BAP EQUIVALENT					BAP EQUIVALENT					
						Total Risk Across Surface Soil	8.8E-06					Total Hazard Index Across All Media and All Exposure Routes	7.6E-02

Total Risk Across All Media and All Exposure Routes: 8.8E-06

Total Blood HI = 4.7E-03
Total Skin HI = 5.3E-02
Total Lifetme HI = 4.7E-03
Total Kidney HI = 2.0E-03

000383

Table9AdultResImpactSurfSoilRME.xls

3/22/00 2:32 PM

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-4
OU2 RECORD OF DECISION
DRMO IMPACT AREA RELATED RISK TABLES FROM 2000 HHRA
PAGE 10 OF 15

TABLE B.4-9.6. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CHILD RESIDENT
DRMO IMPACT AREA - SURFACE SOIL (0 - 1 foot bgs)
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current / Future
Receptor Population: Resident
Receptor Age: Child (0-6 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Entire DRMO Impact Area	Benzo(a)pyrene	4.8E-07		1.8E-07	6.6E-07	Benzo(a)pyrene					
			4,4'-DDE	2.9E-07		2.5E-08	3.1E-07	4,4'-DDE					
			4,4'-DDT	3.5E-07		3.0E-08	3.8E-07	4,4'-DDT	Liver	2.4E-02		2.1E-03	2.6E-02
			Antimony					Antimony	Longevity/Blood	4.4E-02			4.4E-02
			Arsenic	1.7E-05		1.5E-06	1.9E-05	Arsenic	Skin	4.4E-01		3.9E-02	4.8E-01
			Cadmium					Cadmium	Kidney	1.0E-02		5.9E-03	1.6E-02
			Chromium					Chromium	NOAEL	9.7E-02			9.7E-02
			Lead					Lead					
			Thallium					Thallium		3.1E-02			3.1E-02
			DDT EQUIVALENT					DDT EQUIVALENT					
			BAP EQUIVALENT					BAP EQUIVALENT					
			Total Risk Across Surface Soil				2.0E-05	Total Hazard Index Across All Media and All Exposure Routes					7.0E-01

Total Risk Across All Media and All Exposure Routes: 2.0E-05

Total Blood HI =	4.4E-02
Total Skin HI =	4.8E-01
Total Lifetme HI =	4.4E-02
Total Kidney HI =	1.6E-02

000387

Table9ChildResImpactSurfSoilRME.xls

3/22/00 2:35 PM

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-4
OU2 RECORD OF DECISION
DRMO IMPACT AREA RELATED RISK TABLES FROM 2000 HHRA
PAGE 11 OF 15

TABLE B.4-9.7. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - COMMERCIAL WORKER
DRMO IMPACT AREA - 0 - 2 FEET bgs
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current / Future
Receptor Population: Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface and Subsurface Soil	Soil	Entire DRMO Impact Area	Arsenic Chromium Lead	7.2E-06		1.1E-06	8.3E-06	Arsenic Chromium Lead	Skin NOAEL	4.5E-02 1.6E-02		6.8E-03	5.2E-02 1.6E-02
						Total Risk Across Surface Soil	8.3E-06					Total Hazard Index Across All Media and All Exposure Routes	6.8E-02

Total Risk Across All Media and All Exposure Routes 8.3E-06

Total Skin HI = 5.2E-02

000389

Table9CommercialImpactALLSoilRMEIND.xls

3/22/00 2:37 PM

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-4
OU2 RECORD OF DECISION
DRMO IMPACT AREA RELATED RISK TABLES FROM 2000 HHRA
PAGE 12 OF 15

TABLE B.4-9.8. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADULT RECREATIONAL USER
DRMO IMPACT AREA - 0 - 2 FEET bgs
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current / Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface and Subsurface Soil	Soil	Entire DRMO Impact Area	Arsenic Chromium Lead	1.2E-06		2.9E-07	1.5E-06	Arsenic Chromium Lead	Skin NOAEL	7.8E-03 2.8E-03		1.9E-03	9.7E-03 2.8E-03
							Total Risk Across Surface Soil	1.5E-06					Total Hazard Index Across All Media and All Exposure Routes	1.2E-02
													Total Skin HI =	9.7E-03
							Total Risk Across All Media and All Exposure Routes	1.5E-06						

000391

Table9AdultRecrImpactALLSoilRMEIND.xls

3/22/00 2:29 PM

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-4
OU2 RECORD OF DECISION
DRMO IMPACT AREA RELATED RISK TABLES FROM 2000 HHRA
PAGE 13 OF 15

TABLE 6.4-9.9. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CHILD RECREATIONAL USER
DRMO IMPACT AREA - 0 - 2 FEET bgs
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current / Future
Receptor Population: Recreational User
Receptor Age: Child (0-6 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface and Subsurface Soil	Soil	Entire DRMO Impact Area	Arsenic	2.8E-06		4.9E-07	3.3E-06	Arsenic	Skin	7.3E-02		1.3E-02	8.6E-02
			Chromium					Chromium	NOAEL	2.6E-02			2.6E-02
			Lead					Lead					
			Total Risk Across Surface Soil				3.3E-06		Total Hazard Index Across All Media and All Exposure Routes				1.1E-01

Total Risk Across All Media and All Exposure Routes 3.3E-06

Total Skin HI = 8.6E-02

000393

Table9ChildRecrImpactALLSoilRMEIND.xls

3/22/00 2:34 PM

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-4
OU2 RECORD OF DECISION
DRMO IMPACT AREA RELATED RISK TABLES FROM 2000 HHRA
PAGE 14 OF 15

TABLE B.4-9.10. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FUTURE ADULT RESIDENT
DRMO IMPACT AREA - SOIL (0 - 2 feet bgs)
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current / Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface and Subsurface Soil	Soil	Entire DRMO Impact Area	Benzo(a)pyrene	2.5E-07		1.3E-07	3.8E-07	Benzo(a)pyrene					
			4,4'-DDE	4.5E-08		5.4E-09	5.1E-08	4,4'-DDE					
			4,4'-DDT	4.9E-08		5.9E-09	5.5E-08	4,4'-DDT	Liver	8.5E-04		1.0E-04	9.5E-04
			Antimony					Antimony	Longevity/Blood	6.1E-03			6.1E-03
			Arsenic	6.9E-06		8.3E-07	7.8E-06	Arsenic	Skin	4.5E-02		5.4E-03	5.0E-02
			Cadmium					Cadmium	Kidney	1.0E-03			1.0E-03
			Chromium					Chromium	NOAEL	1.6E-02			1.6E-02
			Lead					Lead					
			Manganese					Manganese	CNS	9.0E-03			9.0E-03
			Thallium					Thallium		2.8E-03			2.8E-03
			Vanadium					Vanadium	Lifetime	1.2E-02			1.2E-02
			BAP EQUIVALENT					BAP EQUIVALENT					
			Total Risk Across Surface Soil				8.3E-06		Total Hazard Index Across All Media and All Exposure Routes				9.8E-02

Total Risk Across All Media and All Exposure Routes: 8.3E-06

Total CNS HI =	9.0E-03
Total Blood HI =	6.1E-03
Total Skin HI =	5.0E-02
Total Lifetime HI =	1.8E-02
Total Kidney HI =	1.0E-03
Total Liver HI =	9.5E-04

000393

Table9AdultResImpactALLSoilRME.xls

3/22/00 2:32 PM

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-4
OU2 RECORD OF DECISION
DRMO IMPACT AREA RELATED RISK TABLES FROM 2000 HHRA
PAGE 15 OF 15

TABLE B.4-9.11. REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CHILD RESIDENT
DRMO IMPACT AREA - SOIL (0 - 2 feet bgs)
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current / Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface and Subsurface Soil	Soil	Entire DRMO Impact Area	Benzo(a)pyrene	5.8E-07		2.2E-07	8.0E-07	Benzo(a)pyrene					
			4,4'-DDE	1.1E-07		9.2E-09	1.1E-07	4,4'-DDE					
			4,4'-DDT	1.1E-07		1.0E-08	1.2E-07	4,4'-DDT	Liver	7.9E-03		6.9E-04	8.6E-03
			Antimony					Antimony	Longevity/Blood	5.7E-02			5.7E-02
			Arsenic	1.6E-05		1.4E-06	1.8E-05	Arsenic	Skin	4.2E-01		3.7E-02	4.6E-01
			Cadmium					Cadmium	Kidney	9.6E-03			9.6E-03
			Chromium					Chromium	NOAEL	1.5E-01			1.5E-01
			Lead					Lead					
			Manganese					Manganese	CNS	8.4E-02			8.4E-02
			Thallium					Thallium		2.6E-02			2.6E-02
			Vanadium					Vanadium	Lifetime	1.1E-01			1.1E-01
			BAP EQUIVALENT					BAP EQUIVALENT					
				Total Risk Across Surface Soil			1.9E-05					Total Hazard Index Across All Media and All Exposure Routes	9.0E-01

Total Risk Across All Media and All Exposure Routes: 1.9E-05

Total CNS HI =	8.4E-02
Total Blood HI =	5.7E-02
Total Skin HI =	4.6E-01
Total Lifetme HI =	1.7E-01
Total Kidney HI =	9.6E-03
Total Liver HI =	8.6E-03

000397

Table9ChildResImpactALLSoilRME.xls

3/22/00 2:36 PM

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-5
OU2 RECORD OF DECISION
GROUNDWATER RELATED RISK TABLES FROM 2000 HHRA
PAGE 1 OF 3

TABLE B.2-3.1
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY - GROUNDWATER
OU2
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current / Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Sites 6 and 29

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Antimony	mg/L	1.29E-02	NA	2.24E-02		mg/L	1.27E-02	Max. Temp. Avg.		1.27E-02	Max. Temp. Avg.	
Arsenic	mg/L	1.94E-02	NA	8.63E-02		mg/L	3.30E-02	Max. Temp. Avg.		3.30E-02	Max. Temp. Avg.	
Chromium	mg/L	5.73E-03	NA	1.98E-02	J	mg/L	5.76E-03	Max. Temp. Avg.		5.76E-03	Max. Temp. Avg.	
Lead	mg/L	2.67E-02	NA	1.72E-01		mg/L	7.28E-02	Max. Temp. Avg.		7.28E-02	Max. Temp. Avg.	
Manganese	mg/L	9.86E-01	NA	4.26E+00		mg/L	2.73E+00	Max. Temp. Avg.		2.73E+00	Max. Temp. Avg.	
Nickel	mg/L	2.28E-02	NA	9.98E-02	J	mg/L	5.86E-02	Max. Temp. Avg.		5.86E-02	Max. Temp. Avg.	

Max. Temp. Avg. = Maximum Temporal Average of Monitoring Wells for Rounds 7 - 10.

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-5
OU2 RECORD OF DECISION
GROUNDWATER RELATED RISK TABLES FROM 2000 HHRA
PAGE 2 OF 3

TABLE B.2-7.1. REASONABLE MAXIMUM EXPOSURE (RME)

CALCULATION OF NON-CANCER HAZARDS
EXPOSURE OF CONSTRUCTION WORKERS TO GROUNDWATER
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Surficial Aquifer
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Antimony	1.27E-02	mg/L	1.27E-02	mg/L	M	3.2E-06	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	5.4E-02
	Arsenic	3.30E-02	mg/L	3.30E-02	mg/L	M	8.4E-06	mg/kg-day	3.00E-04	mg/kg-day	NA	NA	2.8E-02
	Chromium	5.76E-03	mg/L	5.76E-03	mg/L	M	2.9E-06	mg/kg-day	7.50E-05	mg/kg-day	NA	NA	3.9E-02
	Lead	7.28E-02	mg/L	7.28E-02	mg/L	M	1.9E-05	mg/kg-day		mg/kg-day	NA	NA	
	Manganese	2.73E+00	mg/L	2.73E+00	mg/L	M	7.0E-04	mg/kg-day	1.40E-03	mg/kg-day	NA	NA	5.0E-01
	Nickel	5.86E-02	mg/L	5.86E-02	mg/L	M	1.5E-05	mg/kg-day	8.00E-04	mg/kg-day	NA	NA	1.9E-02
	(total)												6.4E-01
												Total Hazard Index Across All Exposure Routes/Pathways	6.4E-01

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

000149

OU2GWConstW.xls Table7

3/22/00 3:07 PM

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-5
OU2 RECORD OF DECISION
GROUNDWATER RELATED RISK TABLES FROM 2000 HHRA
PAGE 3 OF 3

TABLE B.2-8.1. REASONABLE MAXIMUM EXPOSURE (RME)

CALCULATION OF CANCER RISKS
EXPOSURE OF CONSTRUCTION WORKERS TO GROUNDWATER
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Surficial Aquifer
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Antimony	1.27E-02	mg/L	1.27E-02	mg/L	M	4.6E-08	mg/kg-day	1.50E+00	$(mg/kg-day)^{-1}$	1.8E-07
	Arsenic	3.30E-02	mg/L	3.30E-02	mg/L	M	1.2E-07	mg/kg-day		$(mg/kg-day)^{-1}$	
	Chromium	5.76E-03	mg/L	5.76E-03	mg/L	M	4.2E-08	mg/kg-day		$(mg/kg-day)^{-1}$	
	Lead	7.28E-02	mg/L	7.28E-02	mg/L	M	2.7E-07	mg/kg-day		$(mg/kg-day)^{-1}$	
	Manganese	2.73E+00	mg/L	2.73E+00	mg/L	M	1.0E-05	mg/kg-day		$(mg/kg-day)^{-1}$	
	Nickel	5.86E-02	mg/L	5.86E-02	mg/L	M	2.1E-07	mg/kg-day		$(mg/kg-day)^{-1}$	
	(total)										1.8E-07
										Total Risk Across All Exposure Routes/Pathways	**1.8E-07**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

000150

OU2GWConstW.xls Table8

3/22/00 3:07 PM

SOURCE: APPENDIX B OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-6
OU2 RECORD OF DECISION
LEAD MODEL RESULTS FROM 2000 HHRA
PAGE 1 OF 19

Calculations of 95th Percentile Fetal Blood Lead Concentrations for Adult Exposure to Soil

SITE NAME: SITE 6
LOCATION: PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
RECEPTOR: CONSTRUCTION WORKER
DATE: 30-Aug-00

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and th concentration in the developing fetuses of adult women. This spreadsheet calculates a range of 95th percentile fetal blood lead concentration estimates of blood lead concentrations in pregnant adult women using the exposure parameters identified below (U.S. EPA, Recommendation Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, Decembe

RELEVANT EQUATIONS: $PbB_{fetal,\,GM} = R_{fetal/maternal} \times [PbB_{adult,\,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\,0.95} = PbB_{fetal,\,GM} \times GSD_{i,\,adult}^{1.645}$

Exposure Parameter	Description (units)	Receptor
$PbB_{adult,\,0}$	Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL)	2
PbS	Site-specific soil lead concentration (mg/kg)	23987
BKSF	Biokinetic slope factor (ug/dL per ug/day))	0.4
IR_s	Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day)	0.100
AF_s	Absolute gastrointestinal absorption fraction (unitless)	0.12
EF_s	Exposure frequency (days/year)	150
AT	Averaging time (days/year)	365
$GSD_{i,\,adult}$	Estimate of individual geometric standard deviation among adults (unitless)	2
$R_{fetal/maternal}$	Constant of proportionality between fetal blood lead concentraiton at birth and maternal blood lead concentration (unitless)	0.9
$PbB_{adult,\,central}$	Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)	49.32
$PbB_{fetal,\,GM}$	Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.	44.39
	Probability that $PbB_{fetal,\,GM}$ exceeds 10 ug/dL	98.42%

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the EF_s is less than 1 day/week.

pb_adultSite6resp.xlsConstW

SOURCE: APPENDIX I OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-6
OU2 RECORD OF DECISION
LEAD MODEL RESULTS FROM 2000 HHRA
PAGE 2 OF 19

Calculations of 95th Percentile Fetal Blood Lead Concentrations for Adult Exposure to Soil

SITE NAME: SITE 6
LOCATION: PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
RECEPTOR: ADULT RECREATIONAL USER
DATE: 30-Aug-00

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the l concentration in the developing fetuses of adult women. This spreadsheet calculates a range of 95th percentile fetal blood lead concentrations fr estimates of blood lead concentrations in pregnant adult women using the exposure parameters identified below (U.S. EPA, Recommendations o Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1

RELEVANT EQUATIONS: $PbB_{fetal,\ GM} = R_{fetal/matemat} \times [PbB_{adult,\ 0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\ 0.95} = PbB_{fetal,\ GM} \times GSD_{i,\ adult}$

Exposure Parameter	Description (units)	Receptor
$PbB_{adult,\ 0}$	Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL)	2
PbS	Site-specific soil lead concentration (mg/kg)	27442
BKSF	Biokinetic slope factor (ug/dL per ug/day))	0.4
IR_s	Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day)	0.050
AF_s	Absolute gastrointestinal absorption fraction (unitless)	0.12
EF_s	Exposure frequency (days/year)	52
AT	Averaging time (days/year)	365
$GSD_{i,\ adult}$	Estimate of individual geometric standard deviation among adults (unitless)	2
$R_{fetal/maternal}$	Constant of proportionality between fetal blood lead concentraiton at birth and maternal blood lead concentration (unitless)	0.9
$PbB_{adult,\ central}$	Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)	11.38
$PbB_{fetal,\ GM}$	Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.	10.24
	Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL	51.39%

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the EF_s is less than 1 day/week.

pb_adultSite6resp.xls RecUser

SOURCE: APPENDIX I OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

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LEAD MODEL RESULTS FROM 2000 HHRA
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Calculations of 95th Percentile Fetal Blood Lead Concentrations for Adult Exposure to Soil

SITE NAME: SITE 6
LOCATION: PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
RECEPTOR: OCCUPATIONAL WORKER
DATE: 30-Aug-00

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and th concentration in the developing fetuses of adult women. This spreadsheet calculates a range of 95th percentile fetal blood lead concentration estimates of blood lead concentrations in pregnant adult women using the exposure parameters identified below (U.S. EPA, Recommendation Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, Decembe

RELEVANT EQUATIONS: $PbB_{fetal,\,GM} = R_{fetal/maternal} \times [PbB_{adult,\,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\,0.95} = PbB_{fetal,\,GM} \times GSD_{i,\,adult}^{1.645}$

Exposure Parameter	Description (units)	Receptor
$PbB_{adult,\,0}$	Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL)	2
PbS	Site-specific soil lead concentration (mg/kg)	27442
BKSF	Biokinetic slope factor (ug/dL per ug/day))	0.4
IR_s	Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day)	0.050
AF_s	Absolute gastrointestinal absorption fraction (unitless)	0.12
EF_s	Exposure frequency (days/year)	150
AT	Averaging time (days/year)	365
$GSD_{i,\,adult}$	Estimate of individual geometric standard deviation among adults (unitless)	2
$R_{fetal/maternal}$	Constant of proportionality between fetal blood lead concentraiton at birth and maternal blood lead concentration (unitless)	0.9
$PbB_{adult,\,central}$	Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)	29.07
$PbB_{fetal,\,GM}$	Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have sit exposures to soil lead at concentration, PbS	26.16
	Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL	91.73%

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the EF_s is less than 1 day/week.

pb_adultSite6resp.xls Commercial

SOURCE: APPENDIX I OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

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Calculations of 95th Percentile Fetal Blood Lead Concentrations for Adult Exposure to Soil

SITE NAME: SITE 29
LOCATION: PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
RECEPTOR: CONSTRUCTION WORKER
DATE: 30-Aug-00

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and tl concentration in the developing fetuses of adult women. This spreadsheet calculates a range of 95th percentile fetal blood lead concentratior estimates of blood lead concentrations in pregnant adult women using the exposure parameters identified below (U.S. EPA, Recommendatior Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, Decembe

RELEVANT EQUATIONS: $PbB_{fetal,\,GM} = R_{fetal/maternal} \times [PbB_{adult,\,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\,0.95} = PbB_{fetal,\,GM} \times GSD_{i,\,adult}^{1.645}$

Exposure Parameter	Description (units)	Receptor
$PbB_{adult,\,0}$	Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL)	2
PbS	Site-specific soil lead concentration (mg/kg)	4475
BKSF	Biokinetic slope factor (ug/dL per ug/day))	0.4
IR_s	Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day)	0.100
AF_s	Absolute gastrointestinal absorption fraction (unitless)	0.12
EF_s	Exposure frequency (days/year)	150
AT	Averaging time (days/year)	365
$GSD_{i,\,adult}$	Estimate of individual geometric standard deviation among adults (unitless)	2
$R_{fetal/maternal}$	Constant of proportionality between fetal blood lead concentraiton at birth and maternal blood lead concentration (unitless)	0.9
$PbB_{adult,\,central}$	Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)	10.83
$PbB_{fetal,\,GM}$	Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have sit exposures to soil lead at concentration, PbS.	9.74
	Probability that $PbB_{fetal,\,GM}$ exceeds 10 ug/dL	48.51%

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the EF_s is less than 1 day/week.

pb_adultSite29resp.xlsConstW

SOURCE: APPENDIX I OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

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Calculations of 95th Percentile Fetal Blood Lead Concentrations for Adult Exposure to Soil

SITE NAME: SITE 29
LOCATION: PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
RECEPTOR: ADULT RECREATIONAL USER
DATE: 30-Aug-00

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and th concentration in the developing fetuses of adult women. This spreadsheet calculates a range of 95th percentile fetal blood lead concentration estimates of blood lead concentrations in pregnant adult women using the exposure parameters identified below (U.S. EPA, Recommendatior Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, Decembe

RELEVANT EQUATIONS: $PbB_{fetal,\,GM} = R_{fetal/maternal} \times [PbB_{adult,\,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\,0.95} = PbB_{fetal,\,GM} \times GSD_{i,\,adult}^{1.645}$

Exposure Parameter	Description (units)	Receptor
$PbB_{adult,\,0}$	Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL)	2
PbS	Site-specific soil lead concentration (mg/kg)	694
BKSF	Biokinetic slope factor (ug/dL per ug/day))	0.4
IR_s	Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day)	0.050
AF_s	Absolute gastrointestinal absorption fraction (unitless)	0.12
EF_s	Exposure frequency (days/year)	52
AT	Averaging time (days/year)	365
$GSD_{i,\,adult}$	Estimate of individual geometric standard deviation among adults (unitless)	2
$R_{fetal/maternal}$	Constant of proportionality between fetal blood lead concentraiton at birth and maternal blood lead concentration (unitless)	0.9
$PbB_{adult,central}$	Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)	2.24
$PbB_{fetal,\,GM}$	Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have sit exposures to soil lead at concentration, PbS.	2.01
	Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL	1.04%

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the EF_s is less than 1 day/week.

pb_adultSite29resp.xls RecUser

SOURCE: APPENDIX I OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

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Calculations of 95th Percentile Fetal Blood Lead Concentrations for Adult Exposure to Soil

SITE NAME: SITE 29
LOCATION: PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
RECEPTOR: OCCUPATIONAL WORKER
DATE: 30-Aug-00

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and th concentration in the developing fetuses of adult women. This spreadsheet calculates a range of 95th percentile fetal blood lead concentration estimates of blood lead concentrations in pregnant adult women using the exposure parameters identified below (U.S. EPA, Recommendatior Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, Decembe

RELEVANT EQUATIONS: $PbB_{fetal,\ GM} = R_{fetal/maternal} \times [PbB_{adult,\ 0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\ 0.95} = PbB_{fetal,\ GM} \times GSD_{i,\ adult}^{1.645}$

Exposure Parameter	Description (units)	Receptor
$PbB_{adult,\ 0}$	Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL)	2
PbS	Site-specific soil lead concentration (mg/kg)	694
BKSF	Biokinetic slope factor (ug/dL per ug/day))	0.4
IR_s	Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day)	0.050
AF_s	Absolute gastrointestinal absorption fraction (unitless)	0.12
EF_s	Exposure frequency (days/year)	150
AT	Averaging time (days/year)	365
$GSD_{i,\ adult}$	Estimate of individual geometric standard deviation among adults (unitless)	2
$R_{fetal/maternal}$	Constant of proportionality between fetal blood lead concentraiton at birth and maternal blood lead concentration (unitless)	0.9
$PbB_{adult,\ central}$	Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)	2.68
$PbB_{fetal,\ GM}$	Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have sit exposures to soil lead at concentration, PbS.	2.42
	Probability that $PbB_{fetal,\ GM}$ exceeds 10 ug/dL	2.02%

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the EF_s is less than 1 day/week.

pb_adultSite29resp.xls Commercial

SOURCE: APPENDIX I OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

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LEAD MODEL RESULTS FROM 2000 HHRA
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Calculations of 95th Percentile Fetal Blood Lead Concentrations for Adult Exposure to Soil

SITE NAME: DRMO Impact Area - 0 to 1 Foot Interval
LOCATION: PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
RECEPTOR: ADULT RECREATIONAL USER
DATE: 30-Aug-00

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the l concentration in the developing fetuses of adult women. This spreadsheet calculates a range of 95th percentile fetal blood lead concentrations fr estimates of blood lead concentrations in pregnant adult women using the exposure parameters identified below (U.S. EPA, Recommendations o Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1

RELEVANT EQUATIONS: $PbB_{fetal,\,GM} = R_{fetal/maternal} \times [PbB_{adult,\,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\,0.95} = PbB_{fetal,\,GM} \times GSD_{i,\,adult}^{1.645}$

Exposure Parameter	Description (units)	Receptor
$PbB_{adult,\,0}$	Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL)	2
PbS	Site-specific soil lead concentration (mg/kg)	309
BKSF	Biokinetic slope factor (ug/dL per ug/day))	0.4
IR_s	Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day)	0.050
AF_s	Absolute gastrointestinal absorption fraction (unitless)	0.12
EF_s	Exposure frequency (days/year)	52
AT	Averaging time (days/year)	365
$GSD_{i,\,adult}$	Estimate of individual geometric standard deviation among adults (unitless)	2
$R_{fetal/maternal}$	Constant of proportionality between fetal blood lead concentraiton at birth and maternal blood lead concentration (unitless)	0.9
$PbB_{adult,\,central}$	Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)	2.11
$PbB_{fetal,\,GM}$	Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.	1.90
	Probability that $PbB_{fetal,\,GM}$ exceeds 10 ug/dL.	0.82%

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the EF_s is less than 1 day/week.

pb_adultImpact0_1resp.xls RecUser

SOURCE: APPENDIX I OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

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LEAD MODEL RESULTS FROM 2000 HHRA
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Calculations of 95th Percentile Fetal Blood Lead Concentrations for Adult Exposure to Soil

SITE NAME: DRMO Impact Area - 0 to 1 Foot Interval
LOCATION: PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
RECEPTOR: OCCUPATIONAL WORKER
DATE: 30-Aug-00

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the l concentration in the developing fetuses of adult women. This spreadsheet calculates a range of 95th percentile fetal blood lead concentrations fr estimates of blood lead concentrations in pregnant adult women using the exposure parameters identified below (U.S. EPA, Recommendations o Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1

RELEVANT EQUATIONS: $PbB_{fetal,\ GM} = R_{fetal/maternal} \times [PbB_{adult,\ 0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\ 0.95} = PbB_{fetal,\ GM} \times GSD_{i,\ adult}$

Exposure Parameter	Description (units)	Receptor
$PbB_{adult,\ 0}$	Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL)	2
PbS	Site-specific soil lead concentration (mg/kg)	309
BKSF	Biokinetic slope factor (ug/dL per ug/day))	0.4
IR_s	Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day)	0.050
AF_s	Absolute gastrointestinal absorption fraction (unitless)	0.12
EF_s	Exposure frequency (days/year)	150
AT	Averaging time (days/year)	365
$GSD_{i,\ adult}$	Estimate of individual geometric standard deviation among adults (unitless)	2
$R_{fetal/maternal}$	Constant of proportionality between fetal blood lead concentraiton at birth and maternal blood lead concentration (unitless)	0.9
$PbB_{adult,\ central}$	Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)	2.30
$PbB_{fetal,\ GM}$	Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.	2.07
	Probability that $PbB_{fetal,\ GM}$ exceeds 10 ug/dL	1.16%

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the EF_s is less than 1 day/week.

pb_adultImpact0_1resp.xls Commercial

SOURCE: APPENDIX I OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

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Calculations of 95th Percentile Fetal Blood Lead Concentrations for Adult Exposure to Soil

SITE NAME: **DRMO Impact Area - 0 to 2 Foot Interval**
LOCATION: **PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE**
RECEPTOR: **CONSTRUCTION WORKER**
DATE: **30-Aug-00**

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the concentration in the developing fetuses of adult women. This spreadsheet calculates a range of 95th percentile fetal blood lead concentrations f estimates of blood lead concentrations in pregnant adult women using the exposure parameters identified below (U.S. EPA, Recommendations Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December

RELEVANT EQUATIONS: $PbB_{fetal,\ GM} = R_{fetal/maternal} \times [PbB_{adult,\ 0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\ 0.95} = PbB_{fetal,\ GM} \times GSD_{i,\ adult}^{1.645}$

Exposure Parameter	Description (units)	Receptor
$PbB_{adult,\ 0}$	Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL)	2
PbS	Site-specific soil lead concentration (mg/kg)	254
BKSF	Biokinetic slope factor (ug/dL per ug/day))	0.4
IR_s	Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day)	0.100
AF_s	Absolute gastrointestinal absorption fraction (unitless)	0.12
EF_s	Exposure frequency (days/year)	150
AT	Averaging time (days/year)	365
$GSD_{i,\ adult}$	Estimate of individual geometric standard deviation among adults (unitless)	2
$R_{fetal/maternal}$	Constant of proportionality between fetal blood lead concentraiton at birth and maternal blood lead concentration (unitless)	0.9
$PbB_{adult,\ central}$	Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)	2.50
$PbB_{fetal,\ GM}$	Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.	2.25
	Probability that $PbB_{fetal,\ GM}$ exceeds 10 ug/dL.	1.57%

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the EF_s is less than 1 day/week.

pb_adultImpact0_2resp.xlsConstW

SOURCE: APPENDIX I OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

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Calculations of 95th Percentile Fetal Blood Lead Concentrations for Adult Exposure to Soil

SITE NAME: DRMO Impact Area - 0 to 2 Foot Interval
LOCATION: PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
RECEPTOR: ADULT RECREATIONAL USER
DATE: 30-Aug-00

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and th concentration in the developing fetuses of adult women. This spreadsheet calculates a range of 95th percentile fetal blood lead concentration estimates of blood lead concentrations in pregnant adult women using the exposure parameters identified below (U.S. EPA, Recommendatior Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, Decembe

RELEVANT EQUATIONS: $PbB_{fetal,\,GM} = R_{fetal/maternal} \times [PbB_{adult,\,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\,0.95} = PbB_{fetal,\,GM} \times GSD_{i,\,adult}^{1.645}$

Exposure Parameter	Description (units)	Receptor
$PbB_{adult,\,0}$	Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL)	2
PbS	Site-specific soil lead concentration (mg/kg)	254
BKSF	Biokinetic slope factor (ug/dL per ug/day))	0.4
IR_s	Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day)	0.050
AF_s	Absolute gastrointestinal absorption fraction (unitless)	0.12
EF_s	Exposure frequency (days/year)	52
AT	Averaging time (days/year)	365
$GSD_{i,\,adult}$	Estimate of individual geometric standard deviation among adults (unitless)	2
$R_{fetal/maternal}$	Constant of proportionality between fetal blood lead concentraiton at birth and maternal blood lead concentration (unitless)	0.9
$PbB_{adult,\,central}$	Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)	2.09
$PbB_{fetal,\,GM}$	Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have sit exposures to soil lead at concentration PbS.	1.88
	Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL	0.79%

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the EF_s is less than 1 day/week.

pb_adultImpact0_2resp.xls RecUser

SOURCE: APPENDIX I OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

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LEAD MODEL RESULTS FROM 2000 HHRA
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Calculations of 95th Percentile Fetal Blood Lead Concentrations for Adult Exposure to Soil

SITE NAME: DRMO Impact Area - 0 to 2 Foot Interval
LOCATION: PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
RECEPTOR: OCCUPATIONAL WORKER
DATE: 30-Aug-00

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and th concentration in the developing fetuses of adult women. This spreadsheet calculates a range of 95th percentile fetal blood lead concentration estimates of blood lead concentrations in pregnant adult women using the exposure parameters identified below (U.S. EPA, Recommendatior Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, Decembe

RELEVANT EQUATIONS: $PbB_{fetal,\ GM} = R_{fetal/maternal} \times [PbB_{adult,\ 0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\ 0.95} = PbB_{fetal,\ GM} \times GSD_{i,\ adult}^{1.645}$

Exposure Parameter	Description (units)	Receptor
$PbB_{adult,\ 0}$	Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL)	2
PbS	Site-specific soil lead concentration (mg/kg)	254
BKSF	Biokinetic slope factor (ug/dL per ug/day))	0.4
IR_s	Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day)	0.050
AF_s	Absolute gastrointestinal absorption fraction (unitless)	0.12
EF_s	Exposure frequency (days/year)	150
AT	Averaging time (days/year)	365
$GSD_{i,\ adult}$	Estimate of individual geometric standard deviation among adults (unitless)	2
$R_{fetal/maternal}$	Constant of proportionality between fetal blood lead concentraiton at birth and maternal blood lead concentration (unitless)	0.9
$PbB_{adult,\ central}$	Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)	2.25
$PbB_{fetal,\ GM}$	Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have sit exposures to soil lead at concentration, PbS.	2.03
	Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.	1.06%

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the EF_s is less than 1 day/week.

pb_adultImpact0_2resp.xls Commercial

SOURCE: APPENDIX I OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

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LEAD MODEL RESULTS FROM 2000 HHRA

SITE 6 (MULTIPLE SOURCE)
LEAD MODEL Version 0.99d

AIR CONCENTRATION: 0.220 ug Pb/m3
Indoor AIR Pb Conc: 30.0 percent of outdoor.
Other AIR Parameters:

Age	Time Outdoors (hr)	Vent. Rate (m3/day)	Lung Abs. (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

DIET: DEFAULT

DRINKING WATER Conc: 4.00 ug Pb/L DEFAULT
WATER Consumption: DEFAULT

SOIL & DUST:
Soil: constant conc.
Dust: Multiple Source Analysis

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
0-1	27442.0	19231.4
1-2	27442.0	19231.4
2-3	27442.0	19231.4
3-4	27442.0	19231.4
4-5	27442.0	19231.4
5-6	27442.0	19231.4
6-7	27442.0	19231.4

Additional Dust Sources: None DEFAULT
Soil contribution conversion factor: 0.70
Air contribution conversion factor: 100.0

PAINT Intake: 0.00 ug Pb/day DEFAULT

MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc: 2.50 ug Pb/dL

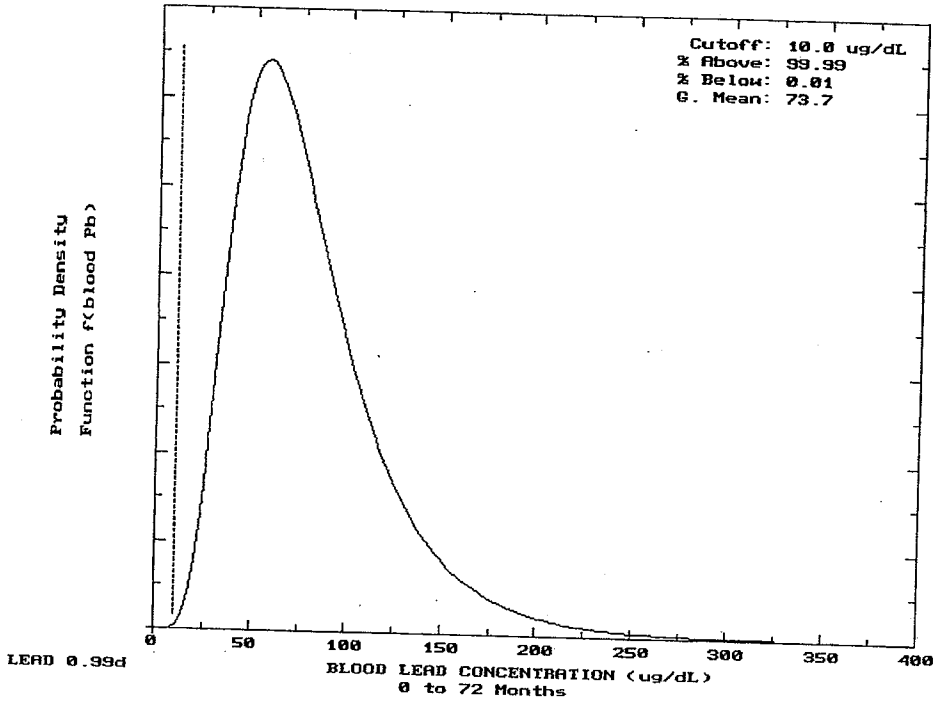
CALCULATED BLOOD Pb and Pb UPTAKES:

YEAR	Blood Level (ug/dL)	Total Uptake (ug/day)	Soil+Dust Uptake (ug/day)
0.5-1:	74.8	168.87	167.92
1-2:	84.6	254.13	252.99
2-3:	80.7	264.88	263.53
3-4:	79.3	276.56	275.17
4-5:	69.9	235.98	234.43
5-6:	62.6	229.99	228.19
6-7:	57.7	229.02	226.99

YEAR	Diet Uptake (ug/day)	Water Uptake (ug/day)	Paint Uptake (ug/day)	Air Uptake (ug/day)
0.5-1:	0.79	0.11	0.00	0.05
1-2:	0.79	0.27	0.00	0.08
2-3:	0.92	0.30	0.00	0.14
3-4:	0.92	0.31	0.00	0.15
4-5:	1.02	0.37	0.00	0.15
5-6:	1.17	0.43	0.00	0.21
6-7:	1.36	0.46	0.00	0.21

SOURCE: APPENDIX I OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-6
OU2 RECORD OF DECISION
LEAD MODEL RESULTS FROM 2000 HHRA
PAGE 13 OF 19



SITE 6
0-2 feet
multiple source

SOURCE: APPENDIX I OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-6
OU2 RECORD OF DECISION
LEAD MODEL RESULTS FROM 2000 HHRA

SITE 29 (MULTIPLE SOURCE)
LEAD MODEL Version 0.99d

AIR CONCENTRATION: 0.220 ug Pb/m3
Indoor AIR Pb Conc: 30.0 percent of outdoor.
Other AIR Parameters:

Age	Time Outdoors (hr)	Vent. Rate (m3/day)	Lung Abs., (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

DIET: DEFAULT

DRINKING WATER Conc: 4.00 ug Pb/L DEFAULT
WATER Consumption: DEFAULT

SOIL & DUST:
Soil: constant conc.
Dust: Multiple Source Analysis

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
0-1	694.0	507.8
1-2	694.0	507.8
2-3	694.0	507.8
3-4	694.0	507.8
4-5	694.0	507.8
5-6	694.0	507.8
6-7	694.0	507.8

Additional Dust Sources: None DEFAULT
Soil contribution conversion factor: 0.70
Air contribution conversion factor: 100.0

PAINT Intake: 0.00 ug Pb/day DEFAULT

MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc: 2.50 ug Pb/dL

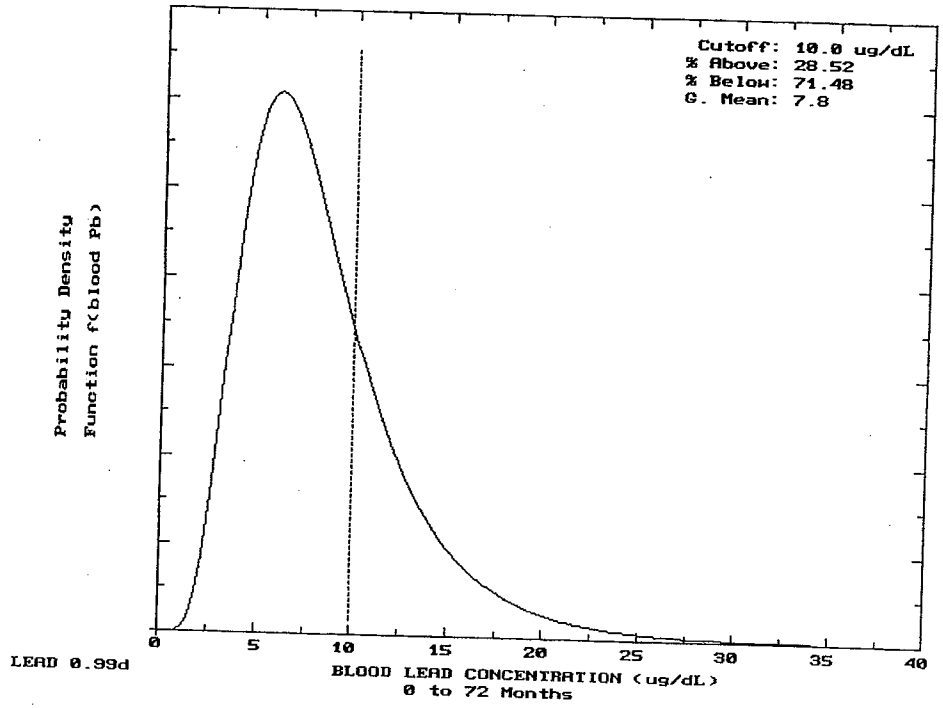
CALCULATED BLOOD Pb and Pb UPTAKES:

YEAR	Blood Level (ug/dL)	Total Uptake (ug/day)	Soil+Dust Uptake (ug/day)
0.5-1:	8.1	15.32	12.63
1-2:	9.3	22.78	19.53
2-3:	8.7	23.73	20.02
3-4:	8.4	24.22	20.50
4-5:	7.0	19.75	15.92
5-6:	5.9	18.74	14.58
6-7:	5.3	18.42	13.90

YEAR	Diet Uptake (ug/day)	Water Uptake (ug/day)	Paint Uptake (ug/day)	Air Uptake (ug/day)
0.5-1:	2.31	0.33	0.00	0.05
1-2:	2.36	0.82	0.00	0.08
2-3:	2.71	0.87	0.00	0.14
3-4:	2.67	0.91	0.00	0.15
4-5:	2.70	0.99	0.00	0.15
5-6:	2.89	1.06	0.00	0.21
6-7:	3.22	1.09	0.00	0.21

SOURCE: APPENDIX I OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-6
OU2 RECORD OF DECISION
LEAD MODEL RESULTS FROM 2000 HHRA



SITE 29
0-2 ft
MULTIPLE
SOURCE

SOURCE: APPENDIX I OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-6
OU2 RECORD OF DECISION
LEAD MODEL RESULTS FROM 2000 HHRA
PAGE 16 OF 19

IMPACT AREA 0 to 1 FOOT (MULTIPLE SOURCE)
LEAD MODEL Version 0.99d

AIR CONCENTRATION: 0.220 ug Pb/m3
Indoor AIR Pb Conc: 30.0 percent of outdoor.
Other AIR Parameters:

Age	Time Outdoors (hr)	Vent. Rate (m3/day)	Lung Abs. (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

DIET: DEFAULT

DRINKING WATER Conc: 4.00 ug Pb/L DEFAULT
WATER Consumption: DEFAULT

SOIL & DUST:
Soil: constant conc.
Dust: Multiple Source Analysis

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
0-1	309.0	238.3
1-2	309.0	238.3
2-3	309.0	238.3
3-4	309.0	238.3
4-5	309.0	238.3
5-6	309.0	238.3
6-7	309.0	238.3

Additional Dust Sources: None DEFAULT
Soil contribution conversion factor: 0.70
Air contribution conversion factor: 100.0

PAINT Intake: 0.00 ug Pb/day DEFAULT

MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc: 2.50 ug Pb/dL

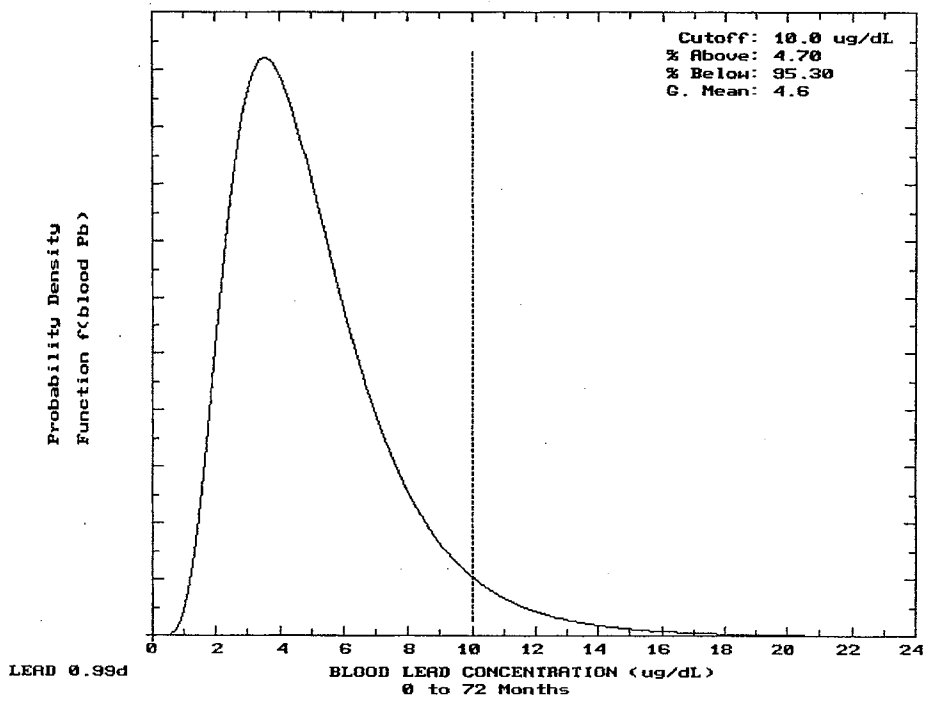
CALCULATED BLOOD Pb and Pb UPTAKES:

YEAR	Blood Level (ug/dL)	Total Uptake (ug/day)	Soil+Dust Uptake (ug/day)
0.5-1:	4.9	9.11	6.21
1-2:	5.5	13.27	9.73
2-3:	5.1	13.87	9.87
3-4:	4.9	13.98	10.01
4-5:	4.1	11.61	7.61
5-6:	3.5	11.22	6.91
6-7:	3.2	11.22	6.56

YEAR	Diet Uptake (ug/day)	Water Uptake (ug/day)	Paint Uptake (ug/day)	Air Uptake (ug/day)
0.5-1:	2.49	0.36	0.00	0.05
1-2:	2.57	0.89	0.00	0.08
2-3:	2.93	0.94	0.00	0.14
3-4:	2.86	0.97	0.00	0.15
4-5:	2.82	1.03	0.00	0.15
5-6:	3.00	1.10	0.00	0.21
6-7:	3.33	1.12	0.00	0.21

SOURCE: APPENDIX I OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE,
TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-6
OU2 RECORD OF DECISION
LEAD MODEL RESULTS FROM 2000 HHRA
PAGE 17 OF 19



DERMO IMPACT AREA 0-1 ft MULTIPLE SOURCE

SOURCE: APPENDIX I OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-6
OU2 RECORD OF DECISION
LEAD MODEL RESULTS FROM 2000 HHRA
PAGE 18 OF 19

IMPACT AREA 0 to 2 FEET (MULTIPLE SOURCE)
LEAD MODEL Version 0.99d

AIR CONCENTRATION: 0.220 ug Pb/m3
Indoor AIR Pb Conc: 30.0 percent of outdoor.
Other AIR Parameters:

Age	Time Outdoors (hr)	Vent. Rate (m3/day)	Lung Abs. (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

DIET: DEFAULT

DRINKING WATER Conc: 4.00 ug Pb/L DEFAULT
WATER Consumption: DEFAULT

SOIL & DUST:
Soil: constant conc.
Dust: Multiple Source Analysis

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
0-1	254.0	199.8
1-2	254.0	199.8
2-3	254.0	199.8
3-4	254.0	199.8
4-5	254.0	199.8
5-6	254.0	199.8
6-7	254.0	199.8

Additional Dust Sources: None DEFAULT
Soil contribution conversion factor: 0.70
Air contribution conversion factor: 100.0

PAINT Intake: 0.00 ug Pb/day DEFAULT

MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc: 2.50 ug Pb/dL

CALCULATED BLOOD Pb and Pb UPTAKES:

YEAR	Blood Level (ug/dL)	Total Uptake (ug/day)	Soil+Dust Uptake (ug/day)
0.5-1:	4.4	8.14	5.21
1-2:	4.9	11.77	8.19
2-3:	4.6	12.33	8.29
3-4:	4.3	12.41	8.40
4-5:	3.7	10.39	6.36
5-6:	3.2	10.10	5.77
6-7:	2.9	10.15	5.47

YEAR	Diet Uptake (ug/day)	Water Uptake (ug/day)	Paint Uptake (ug/day)	Air Uptake (ug/day)
0.5-1:	2.52	0.36	0.00	0.05
1-2:	2.61	0.90	0.00	0.08
2-3:	2.96	0.95	0.00	0.14
3-4:	2.88	0.98	0.00	0.15
4-5:	2.84	1.04	0.00	0.15
5-6:	3.02	1.11	0.00	0.21
6-7:	3.35	1.13	0.00	0.21

SOURCE: APPENDIX I OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

TABLE D-6
OU2 RECORD OF DECISION
LEAD MODEL RESULTS FROM 2000 HHRA
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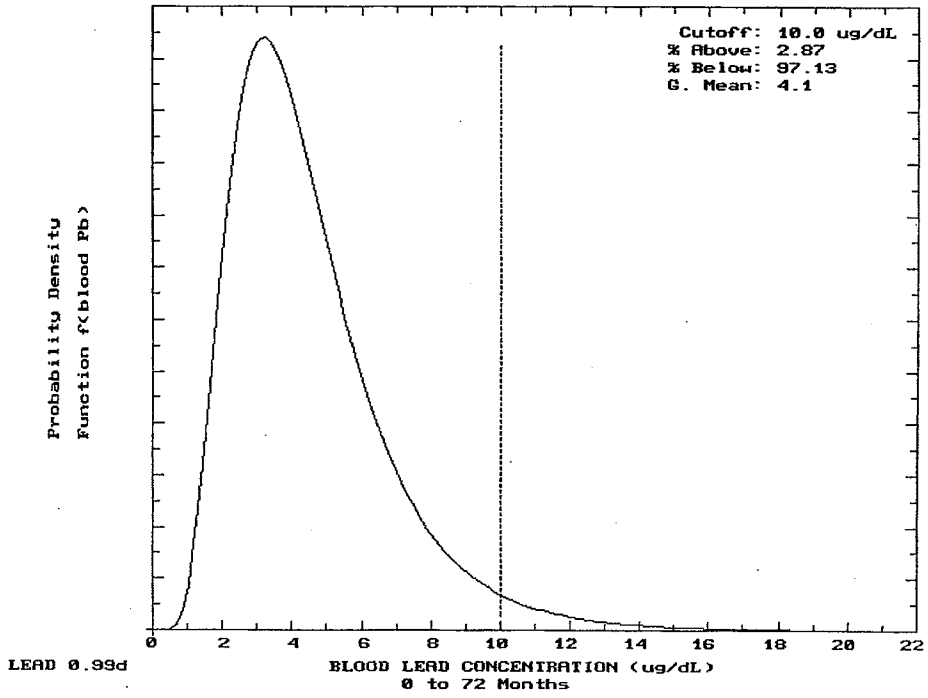


DRMO IMPACT AREA 0-2 ft MULTIPLE SOURCE

SOURCE: APPENDIX I OF REVISED OU2 RISK ASSESSMENT, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, TETRA TECH NUS, KING OF PRUSSIA, PENNSYLVANIA, NOVEMBER 2000.

Appendix D.2

APPENDIX D.2
OU2 RECORD OF DECISION - QUARTERS S AND N RISK CALCULATIONS

TABLE 2.1
DESCRIPTIVE STATISTICS TABLE FOR CHEMICALS OF CONCERN - SURFACE SOIL
QUARTERS S AND N WITHIN THE DRMO IMPACT AREA
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Exposure Point	CAS Number	Chemical	Minimum Concentration[1]	Maximum Concentration[1]	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects[2]	Concentration Used for Screening[3]	Range of Background Concentrations[4]	USEPA RSL Residential Soil[5]	Retained for Further Evaluation?	Rationale[6]
DRMO Impact Area	**Metals**												
	7440-50-8	Copper	11	657	mg/kg	133533-CONF-FLR-004	186/220	8.9 - 58.4	657	NA	3100 N	No	BSL
	7439-92-1	Lead	7.1	584	mg/kg	133533-CONF-PER-001	229/230	18.6 - 18.6	584	NA	400	Yes	ASL

Footnotes:
1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 - Values presented are sample-specific quantitation limits.
3 - The maximum detected concentration is used for screening purposes.
4 - Background concentrations are discussed if necessary in the text (Section 3).
5 - USEPA Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites, June 2011 [hazard quotient (HI) = 1].
6 - The chemical is retained for further quantitative evaluation the maximum detected concentration exceeds the risk-based screening level.

Definitions:
N = Noncarcinogen
NA = Not applicable/not available

Rationale Codes:
For retention for further evaluation:
ASL = Above screening level

For elimination from further evaluation:
BSL = Below screening level

Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained for further evaluation.

Associated Samples

OU2-SS-183-0002	OU2-SS-241-0000	OU2-SS-274-0002	SS-17D(1-1.5)	133533-CONF-FLR-011	133533-CONF-FLR-046	133533-CONF-PER-039
OU2-SS-195-0002	OU2-SS-241-0002	OU2-SS-277-0000	SS-17S(0-0.5)	133533-CONF-FLR-014	133533-CONF-FLR-047	133533-CONF-PER-042
OU2-SS-196-0002	OU2-SS-242-0000	OU2-SS-277-0002	SS-18D(1-1.5)	133533-CONF-FLR-015	133533-CONF-FLR-047-AVG	133533-CONF-PER-043
OU2-SS-206-0000	OU2-SS-242-0002	OU2-SS-278-0000	SS-18S(0-0.5)	133533-CONF-FLR-017	133533-CONF-FLR-047-D	133533-CONF-PER-044
OU2-SS-206-0002	OU2-SS-245-0000	OU2-SS-278-0002	SS-18S(0-0.5)-AVG	133533-CONF-FLR-017-AVG	133533-CONF-FLR-050	133533-CONF-PER-045
OU2-SS-207-0000	OU2-SS-245-0002	OU2-SS-282-0000	SS-18S(0-0.5)-D	133533-CONF-FLR-017-D	133533-CONF-FLR-051	133533-CONF-PER-046
OU2-SS-207-0002	OU2-SS-246-0000	OU2-SS-282-0002	SS-19D(1-1.5)	133533-CONF-FLR-019	133533-CONF-FLR-053	133533-CONF-PER-047
OU2-SS-216-0000	OU2-SS-246-0002	OU2-SS-283-0000	SS-19S(0-0.5)	133533-CONF-FLR-022	133533-CONF-FLR-054	133533-CONF-PER-048
OU2-SS-216-0002	OU2-SS-247-0000	OU2-SS-283-0002	SS-20D(1-1.5)	133533-CONF-FLR-022-AVG	133533-CONF-PER-001	133533-CONF-PER-049
OU2-SS-222-0000	OU2-SS-247-0002	OU2-SS-284-0000	SS-20S(0-0.5)	133533-CONF-FLR-022-D	133533-CONF-PER-005	133533-CONF-PER-050
OU2-SS-222-0002	OU2-SS-248-0000	OU2-SS-284-0002	SS-21D(1-1.5)	133533-CONF-FLR-025	133533-CONF-PER-006	133533-CONF-PER-051
OU2-SS-224-0000	OU2-SS-248-0002	OU2-SS-285-0000	SS-21S(0-0.5)	133533-CONF-FLR-026	133533-CONF-PER-007	133533-CONF-PER-054
OU2-SS-224-0002	OU2-SS-250-0000	OU2-SS-285-0002	SS-22(1.7-1.8)	133533-CONF-FLR-027	133533-CONF-PER-008	133533-CONF-PER-055
OU2-SS-234-0000	OU2-SS-250-0002	OU2-SS-291-0000	SS-22D(1-1.5)	133533-CONF-FLR-027-AVG	133533-CONF-PER-009	133533-CONF-PER-056
OU2-SS-234-0002	OU2-SS-251-0000	OU2-SS-291-0002	SS-22S(0-0.5)	133533-CONF-FLR-027-D	133533-CONF-PER-015	133533-CONF-PER-057
OU2-SS-235-0000	OU2-SS-251-0002	OU2-SS-300-0000	SS-23(1.0-1.2)	133533-CONF-FLR-029	133533-CONF-PER-017	133533-CONF-PER-058
OU2-SS-235-0002	OU2-SS-254-0000	OU2-SS-300-0002	SS-23(1.5-1.7)	133533-CONF-FLR-030	133533-CONF-PER-018	133533-CONF-PER-059
OU2-SS-236-0000	OU2-SS-254-0002	OU2-SS-301-0000	133533-CONF-FLR-002	133533-CONF-FLR-037	133533-CONF-PER-019	133533-CONF-PER-060
OU2-SS-236-0002	OU2-SS-255-0000	OU2-SS-301-0002	133533-CONF-FLR-003	133533-CONF-FLR-038	133533-CONF-PER-023	133533-CONF-PER-061
OU2-SS-237-0000	OU2-SS-255-0002	OU2-SS-302-0000	133533-CONF-FLR-004	133533-CONF-FLR-039	133533-CONF-PER-026	133533-CONF-PER-061-AVG
OU2-SS-237-0002	OU2-SS-271-0000	OU2-SS-302-0002	133533-CONF-FLR-005	133533-CONF-FLR-041	133533-CONF-PER-027	133533-CONF-PER-061-D
OU2-SS-238-0000	OU2-SS-271-0002	SS-14(1.0-1.2)	133533-CONF-FLR-005-AVG	133533-CONF-FLR-042	133533-CONF-PER-029	133533-CONF-PER-062
OU2-SS-238-0002	OU2-SS-272-0000	SS-15D(1-1.5)	133533-CONF-FLR-005-D	133533-CONF-FLR-042-AVG	133533-CONF-PER-031	133533-CONF-PER-063
OU2-SS-239-0000	OU2-SS-272-0002	SS-15S(0-0.5)	133533-CONF-FLR-006	133533-CONF-FLR-042-D	133533-CONF-PER-031-AVG	133533-CONF-PER-066
OU2-SS-239-0002	OU2-SS-273-0000	SS-16(1.5-1.7)	133533-CONF-FLR-007	133533-CONF-FLR-043	133533-CONF-PER-031-D	133533-CONF-PER-067
OU2-SS-240-0000	OU2-SS-273-0002	SS-16D(1-1.5)	133533-CONF-FLR-009	133533-CONF-FLR-044	133533-CONF-PER-037	133533-CONF-PER-068
OU2-SS-240-0002	OU2-SS-274-0000	SS-16S(0-0.5)	133533-CONF-FLR-010	133533-CONF-FLR-045	133533-CONF-PER-038	133533-CONF-PER-069

TABLE 2.1
DESCRIPTIVE STATISTICS TABLE FOR CHEMICALS OF CONCERN - SURFACE SOIL
QUARTERS S AND N WITHIN THE DRMO IMPACT AREA
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

133533-CONF-PER-070
133533-CONF-PER-072
133533-CONF-PER-073
133533-CONF-PER-074
133533-CONF-PER-075
133533-CONF-PER-076
133533-CONF-PER-078
133533-CONF-PER-079
133533-CONF-PER-079-AVG
133533-CONF-PER-079-DUP
133533-CONF-PER-113
133533-CONF-PER-120
133533-CONF-PER-153
133533-CONF-FLR-055
133533-CONF-PER-122
133533-CONF-PER-128
133533-CONF-PER-133
133533-CONF-PER-133-AVG
133533-CONF-PER-133-D
133533-CONF-PER-134
133533-CONF-PER-152
133533-CONF-PER-177
133533-CONF-PER-224
133533-CONF-PER-225
133533-CONF-PER-225-AVG
133533-CONF-PER-225-D
133533-CONF-PER-265
133533-CONF-PER-312
133533-CONF-PER-312-AVG
133533-CONF-PER-312-D
133533-INV-044A
133533-INV-044B
133533-INV-046A
133533-INV-046B
133533-INV-34A
133533-INV-34B
133533_INV_001A
133533_INV_001B
133533_INV_002A
133533_INV_002B
133533_INV_003A
133533_INV_003B
133533_INV_004A
133533_INV_004B
133533_INV_005A
133533_INV_005B
133533_INV_006A
133533_INV_006B
133533_INV_007A
133533_INV_007B
133533_INV_008A
133533_INV_008B
133533_INV_15A
133533_INV_15B
133533_INV_16A
133533_INV_16B
133533_INV_17A
133533_INV_17B
133533_INV_22
133533_INV_024A
133533_INV_024B
133533_INV_29A
133533_INV_29B
133533_INV_30A
133533_INV_30B
133533_INV_31A
133533_INV_31B

APPENDIX D.2
OU2 RECORD OF DECISION - QUARTERS S AND N RISK CALCULATIONS
TABLE 2.2
DESCRIPTIVE STATISTICS TABLE FOR CHEMICALS OF CONCERN - SUBSURFACE SOIL
QUARTERS S AND N WITHIN THE DRMO IMPACT AREA
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Exposure Point	CAS Number	Chemical	Minimum Concentration[1]	Maximum Concentration[1]	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects[2]	Concentration Used for Screening[3]	Range of Background Concentrations[4]	USEPA RSL Residential Soil[5]	Retained for Further Evaluation?	Rationale[6]
Quarters S and N	Metals												
	7440-50-8	Copper	14.1	268	mg/kg	133533-CONF-FLR-021	20/20	--	268	NA	3100 N	No	BSL
	7439-92-1	Lead	9.6	413	mg/kg	133533-CONF-FLR-040	20/20	--	413	NA	400	Yes	ASL

Footnotes:
1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 - Values presented are sample-specific quantitation limits.
3 - The maximum detected concentration is used for screening purposes.
4 - Background concentrations are discussed if necessary in the text (Section 3).
5 - USEPA Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites, June 2011 [hazard quotient (HI) = 1].
6 - The chemical is retained for further quantitative evaluation the maximum detected concentration exceeds the risk-based screening level.

Definitions:
N = Noncarcinogen
NA = Not applicable/not available

Rationale Codes:
For retention for further evaluation:
ASL = Above screening level

For elimination from further evaluation:
BSL = Below screening level

Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained for further evaluation.

Associated Samples
133533-CONF-FLR-040
133533-CONF-FLR-101
133533-CONF-FLR-113
133533-CONF-FLR-118
133533-CONF-FLR-121
133533-CONF-FLR-123
133533-CONF-FLR-131
133533-CONF-FLR-132
133533-CONF-FLR-133
133533-CONF-FLR-134
133533-CONF-FLR-135
133533-CONF-FLR-136
133533-CONF-FLR-152
133533-CONF-FLR-212
133533-CONF-FLR-216
SS-14(24-26)
SS-14(26-28)
SS-18(24-26)
SS-18(24-26)-AVG
SS-18(24-26)-D
SS-18(26-28)
SS-18(32-34)
SS-20(24-26)
SS-20(28-30)
SS-22(24-26)

APPENDIX D.2
OU2 RECORD OF DECISION - QUARTERS S AND N RISK CALCULATIONS

TABLE 3.1.RME
EXPOSURE POINT CONCENTRATION SUMMARY - QUARTERS N SURFACE SOIL
REASONABLE MAXIMUM EXPOSURE
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Quarters N	Lead	mg/kg	219	232 (N)	472 J	219	mg/kg	Arithmetic Mean	(1)

1 - As per USEPA guidance for lead, the mean concentration is used as the exposure point concentration.

APPENDIX D.2
OU2 RECORD OF DECISION - QUARTERS S AND N RISK CALCULATIONS

TABLE 3.2.RME
EXPOSURE POINT CONCENTRATION SUMMARY - QUARTERS S SURFACE SOIL
REASONABLE MAXIMUM EXPOSURE
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean[1]	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Quarters S	Lead	mg/kg	140	216 (G)	584	140	mg/kg	Arithmetic Mean	(2)

1 - One-half the detection limit was used in the arithmetic mean calculation for non-detects.
2 - As per USEPA guidance for lead, the mean concentration is used as the exposure point concentration.

APPENDIX D.2
OU2 RECORD OF DECISION - QUARTERS S AND N RISK CALCULATIONS
TABLE 3.3.RME
EXPOSURE POINT CONCENTRATION SUMMARY - QUARTERS N SUBSURFACE SOIL
REASONABLE MAXIMUM EXPOSURE
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Quarters N	Lead	mg/kg	127	186 (G)	413	127	mg/kg	Arithmetic Mean	(1)

1 - As per USEPA guidance for lead, the mean concentration is used as the exposure point concentration.

APPENDIX D.2
OU2 RECORD OF DECISION - QUARTERS S AND N RISK CALCULATIONS

TABLE 3.4.RME
EXPOSURE POINT CONCENTRATION SUMMARY - QUARTERS S SUBSURFACE SOIL
REASONABLE MAXIMUM EXPOSURE
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Quarters S	Lead	mg/kg	158	NA[1]	293	158	mg/kg	Arithmetic Mean	(2)

1 - Only three samples were available; therefore, ProUCL could not calculate meaningful statistics.
2 - As per USEPA guidance for lead, the mean concentration is used as the exposure point concentration.

LEAD MODEL FOR WINDOWS Version 1.1

==========

Model Version: 1.1 Build11
User Name:
Date:
Site Name:
Operable Unit:
Run Mode: Research

Quarters N SS
Avg. lead = 219 mg/kg

==========

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (µg Pb/m^3)
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

****** Diet ******

Age	Diet Intake(µg/day)
.5-1	2.260
1-2	1.960
2-3	2.130
3-4	2.040
4-5	1.950
5-6	2.050
6-7	2.220

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 4.000 µg Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 163.300 µg/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (µg Pb/g)	House Dust (µg Pb/g)
.5-1	219.000	163.300
1-2	219.000	163.300
2-3	219.000	163.300
3-4	219.000	163.300
4-5	219.000	163.300
5-6	219.000	163.300
6-7	219.000	163.300

****** Alternate Intake ******

Age	Alternate (µg Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

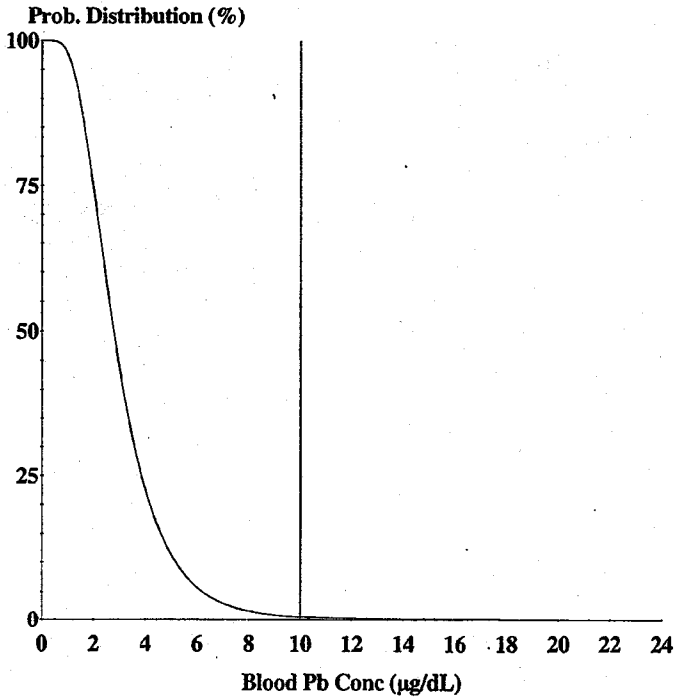
****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 1.000 µg Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (µg/day)	Diet (µg/day)	Alternate (µg/day)	Water (µg/day)
.5-1	0.021	1.056	0.000	0.374
1-2	0.034	0.906	0.000	0.925
2-3	0.062	0.995	0.000	0.972
3-4	0.067	0.962	0.000	1.000
4-5	0.067	0.936	0.000	1.056
5-6	0.093	0.991	0.000	1.121
6-7	0.093	1.077	0.000	1.144

Year	Soil+Dust (µg/day)	Total (µg/day)	Blood (µg/dL)
.5-1	4.490	5.941	3.2
1-2	7.055	8.921	3.7
2-3	7.128	9.157	3.4
3-4	7.197	9.226	3.2
4-5	5.426	7.485	2.7
5-6	4.916	7.121	2.3
6-7	4.659	6.973	2.0

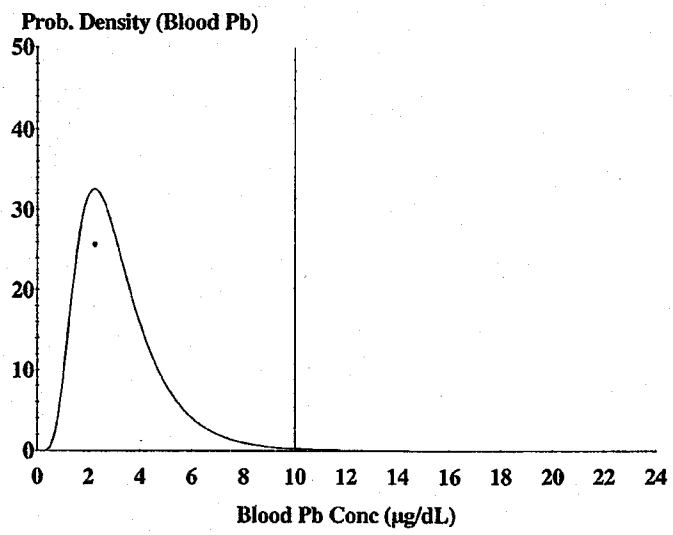


Cutoff = 10.000 µg/dl
Geo Mean = 2.901
GSD = 1.600
% Above = 0.423

Age Range = 0 to 84 months

Run Mode = Research

Qrts. N SS; avg. Pb = 219 mg/kg



Cutoff = 10.000 µg/dl
Geo Mean = 2.901
GSD = 1.600
% Above = 0.423
% Below = 99.577

Age Range = 0 to 84 months

Run Mode = Research

Qrts. N SS; avg. Pb = 219 mg/kg

LEAD MODEL FOR WINDOWS Version 1.1

Model Version: 1.1 Build11
User Name:
Date:
Site Name:
Operable Unit:
Run Mode: Research

Quarters N SB
Avg. lead = 127 mg/kg

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (µg Pb/m^3)
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

****** Diet ******

Age	Diet Intake(µg/day)
.5-1	2.260
1-2	1.960
2-3	2.130
3-4	2.040
4-5	1.950
5-6	2.050
6-7	2.220

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 4.000 µg Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 98.900 µg/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (µg Pb/g)	House Dust (µg Pb/g)
.5-1	127.000	98.900
1-2	127.000	98.900
2-3	127.000	98.900
3-4	127.000	98.900
4-5	127.000	98.900
5-6	127.000	98.900
6-7	127.000	98.900

****** Alternate Intake ******

Age	Alternate (µg Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

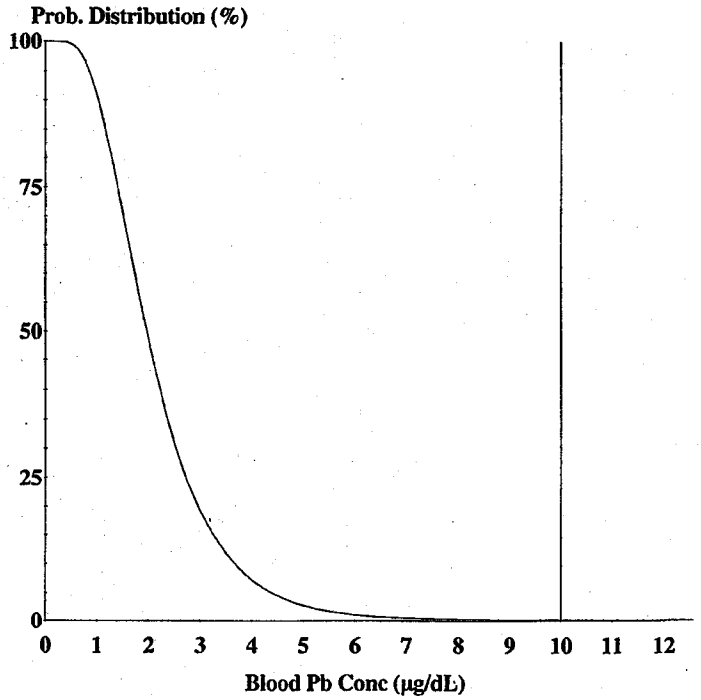
****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 1.000 µg Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (µg/day)	Diet (µg/day)	Alternate (µg/day)	Water (µg/day)
.5-1	0.021	1.078	0.000	0.381
1-2	0.034	0.929	0.000	0.948
2-3	0.062	1.016	0.000	0.992
3-4	0.067	0.980	0.000	1.018
4-5	0.067	0.947	0.000	1.069
5-6	0.093	1.000	0.000	1.132
6-7	0.093	1.086	0.000	1.154

Year	Soil+Dust (µg/day)	Total (µg/day)	Blood (µg/dL)
.5-1	2.713	4.193	2.3
1-2	4.281	6.191	2.6
2-3	4.311	6.381	2.4
3-4	4.340	6.405	2.3
4-5	3.252	5.334	1.9
5-6	2.939	5.164	1.6
6-7	2.782	5.115	1.5

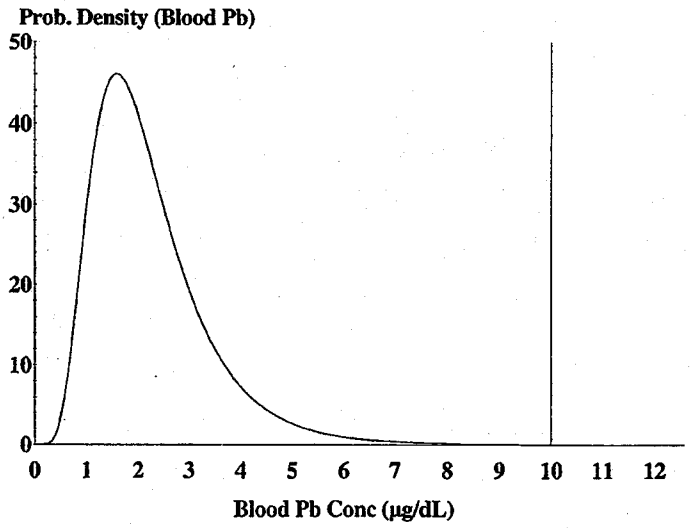


Cutoff = 10.000 µg/dl
Geo Mean = 2.057
GSD = 1.600
% Above = 0.038

Age Range = 0 to 84 months

Run Mode = Research

Qrts. N SB; avg. Pb = 127 mg/kg



Cutoff = 10.000 µg/dl
Geo Mean = 2.057
GSD = 1.600
% Above = 0.038
% Below = 99.962

Age Range = 0 to 84 months

Run Mode = Research

Qrts. N SB; avg. Pb = 127 mg/kg

LEAD MODEL FOR WINDOWS Version 1.1

==========

Model Version: 1.1 Build11
User Name:
Date:
Site Name:
Operable Unit:
Run Mode: Research

Quarters S SS
Avg. lead = 147 mg/kg

==========

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (µg Pb/m^3)
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

****** Diet ******

Age	Diet Intake(µg/day)
.5-1	2.260
1-2	1.960
2-3	2.130
3-4	2.040
4-5	1.950
5-6	2.050
6-7	2.220

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 4.000 µg Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 112.900 µg/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (µg Pb/g)	House Dust (µg Pb/g)
.5-1	147.000	112.900
1-2	147.000	112.900
2-3	147.000	112.900
3-4	147.000	112.900
4-5	147.000	112.900
5-6	147.000	112.900
6-7	147.000	112.900

****** Alternate Intake ******

Age	Alternate (µg Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

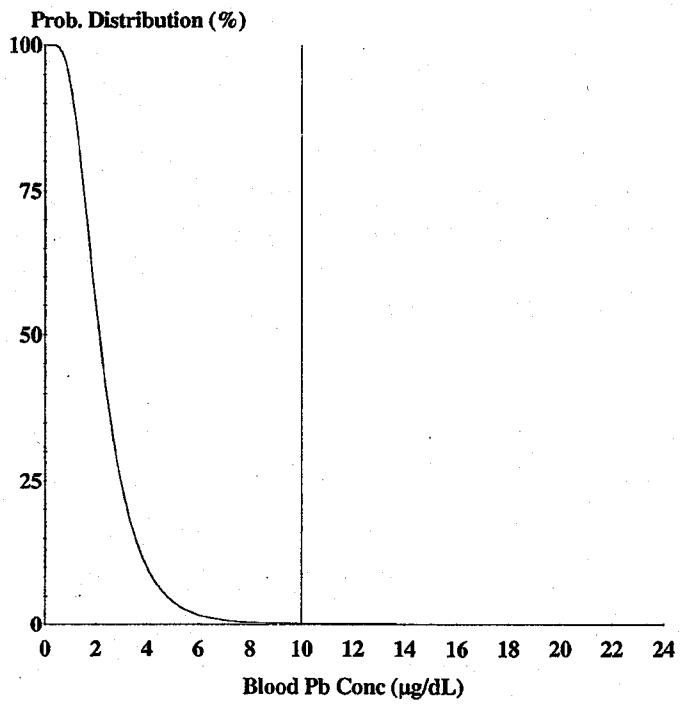
****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 1.000 µg Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (µg/day)	Diet (µg/day)	Alternate (µg/day)	Water (µg/day)
.5-1	0.021	1.073	0.000	0.380
1-2	0.034	0.924	0.000	0.943
2-3	0.062	1.012	0.000	0.988
3-4	0.067	0.976	0.000	1.014
4-5	0.067	0.945	0.000	1.066
5-6	0.093	0.998	0.000	1.130
6-7	0.093	1.084	0.000	1.152

Year	Soil+Dust (µg/day)	Total (µg/day)	Blood (µg/dL)
.5-1	3.105	4.579	2.5
1-2	4.895	6.796	2.8
2-3	4.933	6.994	2.6
3-4	4.970	7.027	2.5
4-5	3.729	5.806	2.1
5-6	3.372	5.593	1.8
6-7	3.192	5.521	1.6

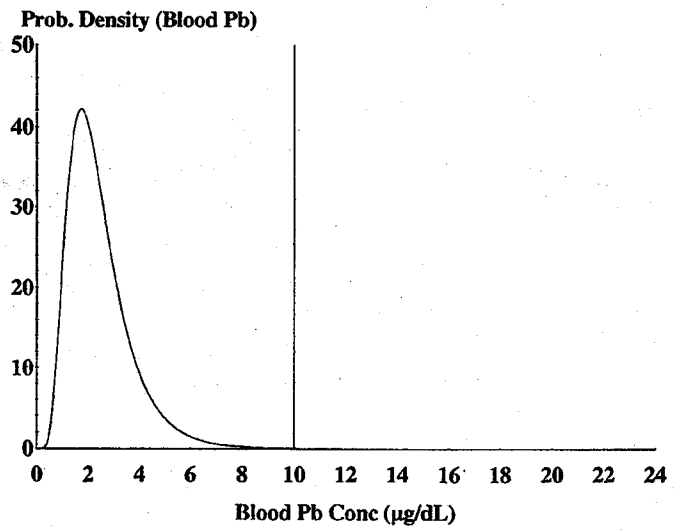


Cutoff = 10.000 µg/dl
Geo Mean = 2.243
GSD = 1.600
% Above = 0.074

Age Range = 0 to 84 months

Run Mode = Research

Qrts S SS; avg Pb = 147 mg/kg



Cutoff = 10.000 µg/dl
Geo Mean = 2.243
GSD = 1.600
% Above = 0.074
% Below = 99.926

Age Range = 0 to 84 months

Run Mode = Research

Qrts S. SS; avg Pb = 147 mg/kg

LEAD MODEL FOR WINDOWS Version 1.1

==========

Model Version: 1.1 Build11
User Name:
Date:
Site Name:
Operable Unit:
Run Mode: Research

Quarters S SB
Average lead = 158 mg/kg

==========

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (µg Pb/m^3)
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

****** Diet ******

Age	Diet Intake(µg/day)
.5-1	2.260
1-2	1.960
2-3	2.130
3-4	2.040
4-5	1.950
5-6	2.050
6-7	2.220

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 4.000 µg Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 120.600 µg/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (µg Pb/g)	House Dust (µg Pb/g)
.5-1	158.000	120.600
1-2	158.000	120.600
2-3	158.000	120.600
3-4	158.000	120.600
4-5	158.000	120.600
5-6	158.000	120.600
6-7	158.000	120.600

****** Alternate Intake ******

Age	Alternate (µg Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

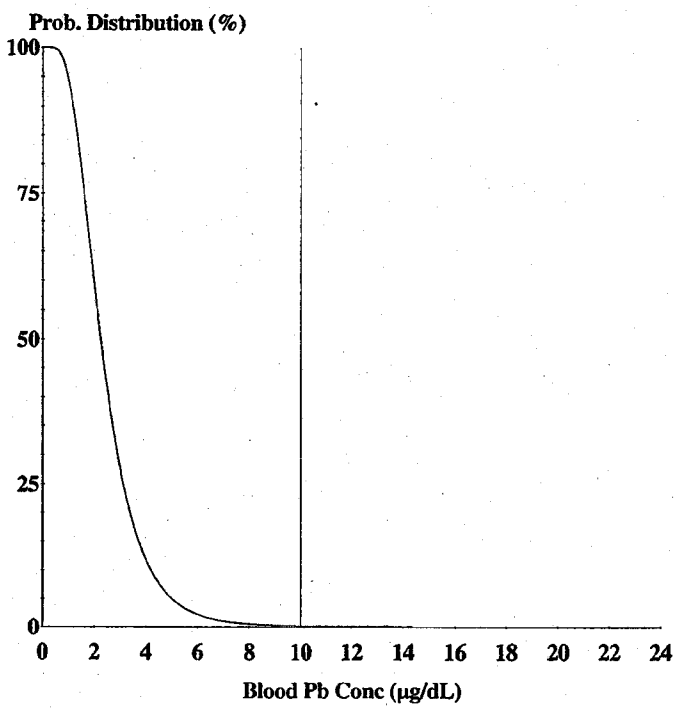
****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 1.000 µg Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (µg/day)	Diet (µg/day)	Alternate (µg/day)	Water (µg/day)
.5-1	0.021	1.070	0.000	0.379
1-2	0.034	0.921	0.000	0.940
2-3	0.062	1.009	0.000	0.985
3-4	0.067	0.974	0.000	1.012
4-5	0.067	0.944	0.000	1.065
5-6	0.093	0.997	0.000	1.128
6-7	0.093	1.083	0.000	1.151

Year	Soil+Dust (µg/day)	Total (µg/day)	Blood (µg/dL)
.5-1	3.319	4.790	2.6
1-2	5.231	7.126	3.0
2-3	5.273	7.329	2.7
3-4	5.314	7.367	2.6
4-5	3.990	6.065	2.2
5-6	3.609	5.828	1.9
6-7	3.418	5.744	1.7

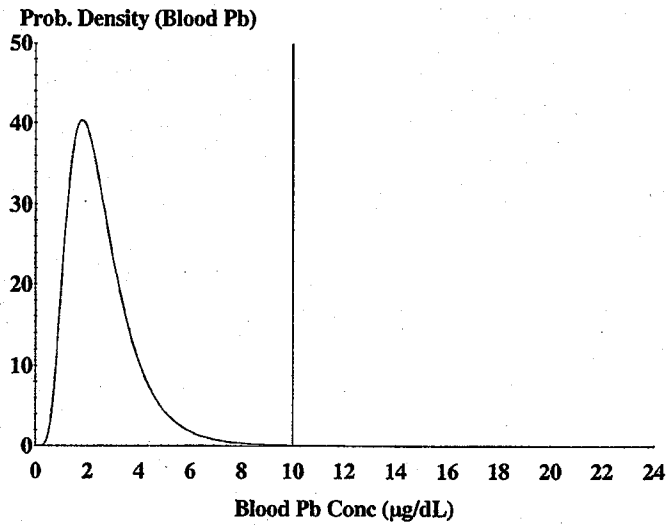


Cutoff = 10.000 µg/dl
Geo Mean = 2.345
GSD = 1.600
% Above = 0.102

Age Range = 0 to 84 months

Run Mode = Research

Qrts S SB; avg. Pb = 158 mg/kg



Cutoff = 10.000 µg/dl
Geo Mean = 2.345
GSD = 1.600
% Above = 0.102
% Below = 99.898

Age Range = 0 to 84 months

Run Mode = Research

Qrts. S SB's avg. Pb = 158 mg/kg

Appendix E
ARARs

TABLE E-1

ALTERNATIVE WDA-3: SURFACE SOIL REMOVAL AND SOIL COVER WITH LAND USE CONTROLS AND MONITORING
CHEMICAL, LOCATION AND ACTION-SPECIFIC ARARs
OPERABLE UNIT 2 - RECORD OF DECISION
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
FEDERAL CHEMICAL-SPECIFIC ARARs				
Soil/Risk Assessment	Office of Solid Waste and Emergency Response (OSWER) Directive 9355.4-12	To be considered (TBC)	United States Environmental Protection Agency (USEPA) has provided recommended methodology for assessing risk caused by exposure to lead in surface soil under residential scenarios.	The remedy will meet the guideline for residential exposure by establishing land use controls (LUCs) that will prevent residential exposure to soil in the waste disposal area at OU2 with concentrations greater than the residential remediation goal (400 mg/kg).
	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. (USEPA, January 2003)	TBC	USEPA has provided recommended methodology for assessing risks to adult receptors caused by exposure to lead in soil under residential and commercial/industrial scenarios.	Guidelines were used to develop risk-based cleanup levels for lead in soil for adult current and future receptors. The remedy will meet the remediation goals by excavating surface soil contaminated with lead, constructing a soil cover, and implementing LUCs to reduce exposure to acceptable levels.
	USEPA Risk Reference Doses (RfDs) from Integrated Risk Information System (IRIS)	TBC	RfDs are estimates of daily exposure for human populations (including sensitive subpopulations) considered unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure over a lifetime.	RfDs were used to develop risk-based soil cleanup levels for non-carcinogenic chemicals of concern (COCs) including antimony, copper, nickel, and polychlorinated biphenyls (PCBs).
	USEPA Human Health Assessment Group Cancer Slope Factors (CSFs) from IRIS	TBC	CSFs present the most up-to-date information on cancer risk potency for known and suspected carcinogens.	CSFs were used to develop risk-based soil cleanup levels for carcinogenic COCs including polycyclic aromatic hydrocarbons (PAHs) and PCBs.

TABLE E-1

ALTERNATIVE WDA-3: SURFACE SOIL REMOVAL AND SOIL COVER WITH LAND USE CONTROLS AND MONITORING
CHEMICAL, LOCATION AND ACTION-SPECIFIC ARARs
OPERABLE UNIT 2 - RECORD OF DECISION
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
	Guidelines for Carcinogen Risk Assessment EPA/630/P-03/001F (March 2005)	TBC	These guidelines are used to perform Human Health Risk Assessment (HHRA). They provide a framework for assessing possible cancer risks from exposures to pollutants or other agents in the environment.	These guidelines were used to develop risk-based soil cleanup goals for carcinogenic COCs including PAHs and PCBs
	Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens EPA/630/R-03/003F (March 2005)	TBC	These guidelines are used to perform HHRA and address a number of issues pertaining to cancer risks associated with early-life exposures in general and provide specific guidance on potency adjustment for carcinogens acting through a mutagenic mode of action.	This guidance was used to develop risk-based soil cleanup goals for carcinogenic COCs including PAHs and PCBs.
NO STATE CHEMICAL-SPECIFIC ARARs				
FEDERAL LOCATION-SPECIFIC ARARs				
Coastal Zone Management	Coastal Zone Management Act [16 United States Code (USC) 1451 *et seq.*]	Applicable	This act provides for the preservation and protection of coastal zone areas. Federal activities that are in or directly affecting the coastal zone must be consistent, to the maximum extent practicable, with a federally approved state management program.	Remedial activities, such as excavation and cover placement, that will take place in the coastal zone will be controlled according to the requirements of the Maine Department of Environmental Protection (MEDEP) program. MEDEP will review the Remedial Design and work plans to ensure that they meet the substantive requirements of this act. The requirements of the act will continue to apply during the operation and maintenance of the remedy.
Floodplain Management	44 CFR 9	Relevant and Appropriate	Federal Emergency Management Agency regulations that set forth the policy, procedure and responsibilities to implement and enforce Executive Order 11988, Floodplain Management.	Remedial activities conducted within the 100-year floodplain of the Piscataqua River will be implemented in compliance with these standards.

TABLE E-1

ALTERNATIVE WDA-3: SURFACE SOIL REMOVAL AND SOIL COVER WITH LAND USE CONTROLS AND MONITORING
CHEMICAL, LOCATION AND ACTION-SPECIFIC ARARs
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PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
Wetlands and US Waters	Clean Water Act (CWA) Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material [40 Code of Federal Regulations (CFR) Part 230; 33 CFR Parts 320 and 323]	Applicable	These regulations outline the requirements for the discharge of dredged or fill material into US waters, including wetlands. No activity that adversely affects a US waters is permitted if a practicable alternative that has less effect is available. If there is no other practicable alternative, impacts must be mitigated.	Excavation of soil at the waste disposal area will be performed so as to not discharge excavated material to the offshore area. The requirements of the act will continue to apply during the operation and maintenance of the remedy.
Other Natural Resources	The Endangered Species Act of 1973 (16 USC 1531 *et seq.*; 50 CFR Parts 17 and 402)	Applicable	Provides for consideration of the impacts on endangered and threatened species and their critical habitats. Requires federal agencies to ensure that any action carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or adversely affect its critical habitat. The entire State of Maine is considered a habitat of the federally listed endangered short-nosed sturgeon.	Remedial activities including excavation, construction of a soil cover, LUCs, and monitoring will be conducted so as to avoid any adverse effect under the act to the short-nosed sturgeon. The requirements of the act will continue to apply during the operation and maintenance of the remedy.
	Fish and Wildlife Coordination Act (16 USC 661 *et seq.*)	Applicable	This act requires any federal agency proposing to modify a body of water to coordinate with the United States Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS) and appropriate state agencies if alteration of a body of water, including discharge of pollutants into a wetland or construction in a wetland, will occur as a result of remedial activities.	Although the Selected Remedy does not affect the shoreline revetment or wetlands, the Navy will coordinate with USFWS in the event that the final design disturbs the revetment or wetlands. The requirements of the act will continue to apply during the operation and maintenance of the remedy.

TABLE E-1

ALTERNATIVE WDA-3: SURFACE SOIL REMOVAL AND SOIL COVER WITH LAND USE CONTROLS AND MONITORING
CHEMICAL, LOCATION AND ACTION-SPECIFIC ARARs
OPERABLE UNIT 2 - RECORD OF DECISION
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
STATE LOCATION-SPECIFIC ARARs				
Natural Resources	Maine Natural Resources Protection Act Permit by Rule Standards [38 Maine Revised Statutes Annotated (MRSA) 480 et seq.; 06-096 Code of Maine Rules (CMR) Part 305, 1, 2, and 8]	Applicable	This act regulates activity conducted in, on, or over any protected natural resource or any activity conducted adjacent to and operated in such a way that material or soil may be washed into any freshwater or coastal wetland, great pond, river, stream or brook.	Excavation near the shoreline of the waste disposal area will be conducted so as to avoid washing any soil into the nearby Piscataqua River or adjacent wetlands. Stormwater management and erosion control practices will be used to prevent sediment from entering the river or adjacent wetlands during construction. The requirements of the act will continue to apply during the operation and maintenance of the remedy.
Wetlands	Maine Wetland Protection Rules (06-096 CMR Part 310)	Applicable	Standards are provided for protection of wetlands, as defined in MEDEP Chapter 1000 Guidelines for Municipal Shoreline Zoning Ordinances. Jurisdiction under the rules includes the area adjacent to the wetlands, which is the area within 75 feet of the normal high-water line. Activities that have an unreasonable impact on wetlands are prohibited.	A wetlands functions and values assessment was conducted that will be used to guide restorative efforts for adjacent wetlands that may be adversely impacted by remedial activities. Excavation activities will be conducted to avoid impacts to wetlands and coastal wetlands, which include tidal and subtidal lands. The requirements of the act will continue to apply during the operation and maintenance of the remedy.

TABLE E-1

ALTERNATIVE WDA-3: SURFACE SOIL REMOVAL AND SOIL COVER WITH LAND USE CONTROLS AND MONITORING
CHEMICAL, LOCATION AND ACTION-SPECIFIC ARARs
OPERABLE UNIT 2 - RECORD OF DECISION
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
Coastal Zone	Maine Coastal Management Policies (38 MRSA 1801 *et seq*.) (06-096 CMR Chapter 1000)	Applicable	Regulates activities near great ponds, rivers and larger streams, coastal areas, and wetlands. Regulates shoreland activities and development, including (but not limited to) water pollution prevention and control, wildlife habitat protection, and freshwater and coastal wetlands protection. The law is administered at the local government level. Shoreland areas include areas within 250 feet of the normal high-water line of any river or saltwater body and areas within 75 feet of the high-water line of a stream.	Remedial activities such as excavation and backfilling that may affect storm water runoff, erosion and sedimentation, and surface water quality will be controlled according to these regulations. The requirements of the act will continue to apply during the operation and maintenance of the remedy.
FEDERAL ACTION-SPECIFIC ARARs				
Surface Water	CWA [33 USC § 1251 *et seq.*]; National Recommended Water Quality Criteria (NRWQC)	Relevant and Appropriate	These criteria are used to establish water quality standards for the protection of aquatic life.	Remedial activities will be conducted to reduce adverse impacts to the Piscataqua River. Stormwater management and erosion control practices will be used to prevent sediment and contaminants from entering the river during construction.
Water Management	CWA Section 402 National Pollutant Discharge Elimination System (NPDES) (40 CFR 122.26)	Applicable	CWA Section 402 requires NPDES permits for stormwater discharges to navigable waters.	Stormwater management will be implemented to minimize discharges of contaminants to the Piscataqua River and meet the substantive requirements of this act.

TABLE E-1

ALTERNATIVE WDA-3: SURFACE SOIL REMOVAL AND SOIL COVER WITH LAND USE CONTROLS AND MONITORING
CHEMICAL, LOCATION AND ACTION-SPECIFIC ARARs
OPERABLE UNIT 2 - RECORD OF DECISION
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
STATE ACTION-SPECIFIC ARARs				
Hazardous Waste	Identification of Hazardous Wastes 06-096 Part 850	Applicable	These standards establish requirements for determining whether wastes are hazardous based on either characteristic or listing. Wastes with PCB concentrations greater than or equal to 50 ppm are hazardous wastes in Maine.	Wastes generated during remedial actions will be analyzed to determine whether they are RCRA characteristic hazardous wastes. If determined to be hazardous waste, then the waste will be managed in accordance with regulatory requirements.
	Standards for Generators of Hazardous Waste (38 MRSA 1301 *et seq.*, 06-096 Part 851)	Applicable	These regulations contain requirements for the generators of hazardous waste.	Waste determined to be hazardous will be managed on site according to the regulation until disposed of off site.
Erosion and Sedimentation Control	Erosion and Sedimentation Control (38 MRSA Part 420-C)	Applicable	Erosion control measures must be in place before activities such as filling, displacing, or exposing soil or other earthen materials occur. Prior MEDEP approval is required if the disturbed area is in the direct watershed of a body of water most at risk for erosion or sedimentation.	These controls will be applicable to excavation and soil cover placement. Applicable plans will be coordinated with MEDEP before implementation.
Storm Water Management	Storm Water Management (38 MRSA Part 420-D; 06-096 CMR Part 500)	Applicable	Storm water management measures must be in place before activities such as filling, displacing, or exposing soil or other earthen material occur on land greater than or equal to 1 acre.	These regulations apply to earth disturbance activities equal to or greater than 1 acre and will be applicable to runoff resulting from earth disturbance activities. Although the area for excavation under Alternative WDA-3 is less than 1 acre, the combined area for the OU2 remedial action will be greater than 1 acre. Applicable plans will be coordinated with MEDEP before implementation.

TABLE E-1

ALTERNATIVE WDA-3: SURFACE SOIL REMOVAL AND SOIL COVER WITH LAND USE CONTROLS AND MONITORING
CHEMICAL, LOCATION AND ACTION-SPECIFIC ARARs
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PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
Air Emissions	Visible Emissions Regulation (38 MRSA Part 584; 06-096 CMR Part 101)	TBC	These regulations establish opacity limits for emissions from several categories of air contaminant sources, including fugitive emissions.	These regulations will be met for excavation and soil cover placement. Emission of particulate matter and fugitive matter (e.g., dust generation) during excavation of surface soil or placement of the soil cover will be controlled.

TABLE E-2

ALTERNATIVE DRMO-4: CONSTRUCTION WORKER EXCAVATION WITH OFF-YARD DISPOSAL, LAND USE CONTROLS, AND MONITORING
CHEMICAL, LOCATION AND ACTION-SPECIFIC ARARs
OPERABLE UNIT 2 - RECORD OF DECISION
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
FEDERAL CHEMICAL-SPECIFIC ARARs				
Soil/Risk Assessment	Office of Solid Waste and Emergency Response (OSWER) Directive 9355.4-12	To be considered (TBC)	United States Environmental Protection Agency (USEPA) has provided recommended methodology for assessing risk caused by exposure to lead in surface soil under residential scenarios.	The remedy will meet the guideline for residential exposure by establishing land use controls (LUCs) that will prevent residential exposure to soil in the Defense Reutilization and Marketing Office (DRMO) area of OU2 with concentrations greater than the residential remediation goal (400 mg/kg).
	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. (USEPA, January 2003)	TBC	USEPA has provided recommended methodology for assessing risks to adult receptors caused by exposure to lead in soil under residential and commercial/industrial scenarios.	Guidelines were used to develop risk-based cleanup levels for lead in soil for adult current and future receptors. The remedy will meet the remediation goals by excavating soil contaminated with lead down to the rock fragment fill layer and implementing LUCs to prevent residential exposure.
	USEPA Risk Reference Doses (RfDs) from Integrated Risk Information System (IRIS)	TBC	RfDs are estimates of daily exposure for human populations (including sensitive subpopulations) considered unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure over a lifetime.	RfDs were used to develop risk-based soil cleanup levels for non-carcinogenic chemicals of concern (COCs) including antimony, copper, nickel, and polychlorinated biphenyls (PCBs).
	USEPA Human Health Assessment Group Cancer Slope Factors (CSFs) from IRIS	TBC	CSFs present the most up-to-date information on cancer risk potency for known and suspected carcinogens.	CSFs were used to develop risk-based soil cleanup levels for carcinogenic COCs including polycyclic aromatic hydrocarbons (PAHs) and PCBs.

TABLE E-2

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Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
	Guidelines for Carcinogen Risk Assessment EPA/630/P-03/001F (March 2005)	TBC	These guidelines are used to perform Human Health Risk Assessment (HHRA). They provide a framework for assessing possible cancer risks from exposures to pollutants or other agents in the environment.	These guidelines were used to develop risk-based soil cleanup goals for carcinogenic COCs including PAHs and PCBs.
	Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens EPA/630/R-03/003F (March 2005)	TBC	These guidelines are used to perform HHRA and address a number of issues pertaining to cancer risks associated with early-life exposures in general and provide specific guidance on potency adjustment for carcinogens acting through a mutagenic mode of action.	This guidance was used to develop risk-based soil cleanup goals for carcinogenic COCs including PAHs and PCBs.
NO STATE CHEMICAL-SPECIFIC ARARs				
FEDERAL LOCATION-SPECIFIC ARARs				
Coastal Zone Management	Coastal Zone Management Act [16 United States Code (USC) 1451 *et seq.*]	Applicable	This act provides for the preservation and protection of coastal zone areas. Federal activities that are in or directly affecting the coastal zone must be consistent, to the maximum extent practicable, with a federally approved state management program.	Remedial activities, such as excavation and backfilling, that will take place in the coastal zone will be controlled according to the requirements of the Maine Department of Environmental Protection (MEDEP) program. MEDEP will review the Remedial Design and work plans to ensure that they meet the substantive requirements of this act. The requirements of the act will continue to apply during the operation and maintenance of the remedy.

TABLE E-2

ALTERNATIVE DRMO-4: CONSTRUCTION WORKER EXCAVATION WITH OFF-YARD DISPOSAL, LAND USE CONTROLS, AND MONITORING
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Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
Floodplain Management	44 CFR 9	Relevant and Appropriate	Federal Emergency Management Agency regulations that set forth the policy, procedure and responsibilities to implement and enforce Executive Order 11988, Floodplain Management.	Remedial activities conducted within the 100-year floodplain of the Piscataqua River will be implemented in compliance with these standards.
Wetlands and US Waters	Clean Water Act (CWA) Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material [40 Code of Federal Regulations (CFR) Part 230; 33 CFR Parts 320 and 323]	Applicable	These regulations outline the requirements for the discharge of dredged or fill material into US waters, including wetlands. No activity that adversely affects a US waters is permitted if a practicable alternative that has less effect is available. If there is no other practicable alternative, impacts must be mitigated.	Excavation of soil at the DRMO area will be performed so as to not discharge excavated material to the offshore area. The requirements of the act will continue to apply during the operation and maintenance of the remedy.
Other Natural Resources	The Endangered Species Act of 1973 (16 USC 1531 *et seq.*; 50 CFR Parts 17 and 402)	Applicable	Provides for consideration of the impacts on endangered and threatened species and their critical habitats. Requires federal agencies to ensure that any action carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or adversely affect its critical habitat. The entire State of Maine is considered a habitat of the federally listed endangered short-nosed sturgeon.	Remedial activities including excavation and disposal, LUCs, and monitoring will be conducted so as to avoid any adverse effect under the act to the short-nosed sturgeon. The requirements of the act will continue to apply during the operation and maintenance of the remedy.

TABLE E-2

ALTERNATIVE DRMO-4: CONSTRUCTION WORKER EXCAVATION WITH OFF-YARD DISPOSAL, LAND USE CONTROLS, AND MONITORING
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PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
	Fish and Wildlife Coordination Act (16 USC 661 *et seq.*)	Applicable	This act requires any federal agency proposing to modify a body of water to coordinate with the United States Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS) and appropriate state agencies if alteration of a body of water, including discharge of pollutants into a wetland or construction in a wetland, will occur as a result of remedial activities.	Excavation of soil along the shoreline will require removal and replacement of the upper portion (above high tide) of the revetment. Remedial activities will be conducted to prevent discharge to the Piscataqua River. The Navy will coordinate with USFWS during the design. The requirements of the act will continue to apply during the operation and maintenance of the remedy.
Historic Preservation	National Historic Preservation Act (16 USC 470 *et seq*.; 36 CFR Part 800)	Applicable	Provides requirements relating to potential loss or destruction of significant scientific, historic, or archaeological data due to remedial actions at a site.	Based on the Portsmouth Naval Shipyard land use map, a portion of the DRMO area has archeological potential. This area is identified as being on the original island; however, borings indicate fill material and not native soil. The Navy will contact the State Historic Preservation Officer (SHPO) to determine the necessary actions, if any, to meet the substantive requirements of this act. The requirements of the act will continue to apply during the operation and maintenance of the remedy.

TABLE E-2

ALTERNATIVE DRMO-4: CONSTRUCTION WORKER EXCAVATION WITH OFF-YARD DISPOSAL, LAND USE CONTROLS, AND MONITORING
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Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
STATE LOCATION-SPECIFIC ARARs				
Natural Resources	Maine Natural Resources Protection Act Permit by Rule Standards [38 Maine Revised Statutes Annotated (MRSA) 480 *et seq*.; 06-096 Code of Maine Rules (CMR) Part 305, 1, 2, and 8]	Applicable	This act regulates activity conducted in, on, or over any protected natural resource or any activity conducted adjacent to and operated in such a way that material or soil may be washed into any freshwater or coastal wetland, great pond, river, stream or brook.	Excavation near to shoreline of the DRMO area will be conducted so as to avoid washing any soil into the nearby Piscataqua River or adjacent wetlands. Stormwater management and erosion control practices will be used to prevent sediment from entering the river or adjacent wetlands during construction. The requirements of the act will continue to apply during the operation and maintenance of the remedy.
Wetlands	Maine Wetland Protection Rules (06-096 CMR Part 310)	Applicable	Standards are provided for protection of wetlands, as defined in MEDEP Chapter 1000 Guidelines for Municipal Shoreline Zoning Ordinances. Jurisdiction under the rules includes the area adjacent to the wetlands, which is the area within 75 feet of the normal high-water line. Activities that have an unreasonable impact on wetlands are prohibited.	A wetlands functions and values assessment was conducted that will be used to guide restorative efforts for adjacent wetlands that may be adversely impacted by remedial activities. Excavation activities will be conducted to avoid impacts to wetlands and coastal wetlands which include tidal and subtidal lands. The requirements of the act will continue to apply during the operation and maintenance of the remedy.

TABLE E-2

ALTERNATIVE DRMO-4: CONSTRUCTION WORKER EXCAVATION WITH OFF-YARD DISPOSAL, LAND USE CONTROLS, AND MONITORING
CHEMICAL, LOCATION AND ACTION-SPECIFIC ARARs
OPERABLE UNIT 2 - RECORD OF DECISION
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
Coastal Zone	Maine Coastal Management Policies (38 MRSA 1801 *et seq*.) (06-096 CMR Chapter 1000)	Applicable	Regulates activities near great ponds, rivers and larger streams, coastal areas, and wetlands. Regulates shoreland activities and development, including (but not limited to) water pollution prevention and control, wildlife habitat protection, and freshwater and coastal wetlands protection. The law is administered at the local government level. Shoreland areas include areas within 250 feet of the normal high-water line of any river or saltwater body and areas within 75 feet of the high-water line of a stream.	Remedial activities such as excavation and backfilling that may affect storm water runoff, erosion and sedimentation, and surface water quality will be controlled according to these regulations. The requirements of the act will continue to apply during the operation and maintenance of the remedy.
FEDERAL ACTION-SPECIFIC ARARs				
Surface Water	CWA [33 USC § 1251 *et seq.*]; National Recommended Water Quality Criteria (NRWQC)	Relevant and Appropriate	These criteria are used to establish water quality standards for the protection of aquatic life.	Remedial activities will be conducted to reduce adverse impacts to the Piscataqua River. Stormwater management and erosion control practices will be used to prevent sediment and contamination from entering the river during construction.
Water Management	CWA Section 402 National Pollutant Discharge Elimination System (NPDES) (40 CFR, 122.26)	Applicable	CWA Section 402 requires NPDES permits for stormwater discharges to navigable waters.	Stormwater management will be implemented to minimize discharges of contaminants to the Piscataqua River and meet the substantive requirements of this act.

TABLE E-2

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Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
STATE ACTION-SPECIFIC ARARs				
Hazardous Waste	Identification of Hazardous Wastes 06-096 Part 850	Applicable	These standards establish requirements for determining whether wastes are hazardous based on either characteristic or listing. Wastes with PCB concentrations greater than or equal to 50 ppm are hazardous wastes in Maine.	Wastes generated during remedial activities will be analyzed to determine whether they are RCRA characteristic hazardous wastes. If determined to be hazardous, then the waste will be managed in accordance with regulatory requirements.
	Standards for Generators of Hazardous Waste (38 MRSA 1301 *et seq.*, 06-096 Part 851)	Applicable	These regulations contain requirements for the generators of hazardous waste.	Waste determined to be hazardous will be managed on site according to the regulation until disposed of off site.
Water Management	Maine Discharge Licenses (38 MRSA 413 *et seq*.) and Waste Discharge Permitting Program (06-096 CMR 520-629)	Applicable	These standards regulate the discharge of pollutants from point sources	These regulations are applicable to water management during soil excavation and discharges of treated water to a surface water body, if required. The substantive requirements will be met if any discharges of treated water to surface water bodies are required during the remedial action.
Erosion and Sedimentation Control	Erosion and Sedimentation Control (38 MRSA Part 420-C)	Applicable	Erosion control measures must be in place before activities such as filling, displacing, or exposing soil or other earthen materials occur. Prior MEDEP approval is required if the disturbed area is in the direct watershed of a body of water most at risk for erosion or sedimentation.	These controls will be applicable to excavation. Applicable plans will be coordinated with MEDEP before implementation.

TABLE E-2

ALTERNATIVE DRMO-4: CONSTRUCTION WORKER EXCAVATION WITH OFF-YARD DISPOSAL, LAND USE CONTROLS, AND MONITORING
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Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
Storm Water Management	Storm Water Management (38 MRSA Part 420-D; 06-096 CMR Part 500)	Applicable	Storm water management measures must be in place before activities such as filling, displacing, or exposing soil or other earthen material occur on land greater than or equal to 1 acre.	These regulations apply to earth disturbance activities equal to or greater than 1 acre and will be applicable to runoff resulting from earth disturbance activities. Although the area for excavation under Alternative DRMO-4 is less than 1 acre, the combined area for the OU2 remedial action will be greater than 1 acre. Applicable plans will be coordinated with MEDEP before implementation.
Waste Management	Additional Standards Applicable to Waste Facilities Located in a Flood Plain (06-096 CMR 854.16)	Relevant and Appropriate	Any facility located or to be located within 300 feet of a 100-year flood zone must be constructed, operated, and maintained to prevent wash-out of any hazardous waste by a 100-year flood or have procedures in place which will cause the waste to be removed to a location where the waste will not be vulnerable to flood waters and to a location that is authorized to manage hazardous waste safely before flood water can reach the facility.	Portions of the DRMO area are within 300 feet of the 100-year flood zone of the Piscataqua River. Waste managed within 300 feet of the 100-year flood zone will be managed in compliance with these standards.
Air Emissions	Visible Emissions Regulation (38 MRSA Part 584; 06-096 CMR Part 101)	TBC	These regulations establish opacity limits for emissions from several categories of air contaminant sources, including general fugitive emissions.	These regulations will be considered for excavation. Emission of particulate matter and fugitive matter (e.g., dust generation) during excavation will be controlled.

Appendix F
Alternative Calculations and Cost Estimates

PORTSMOUTH NAVAL SHIPYARD
Kittery, Maine
OU2 FS
Alternative WDA-3
Annual Cost

3/1/2011 8:47 AM

Item	Item Cost years 1 - 30	Item Cost every 5 years	Item Cost every 10 years	Notes
Annual Site Inspection & Report	$2,700			Labor and supplies once a year to inspect Land Use Controls with Report
Sample Collection	$13,975			Collect 5 groundwater samples & measure sediment thickness from boat
Sample Analysis	$420			Analysis samples for lead, copper, & nickel. Collect samples once a year for 30 years.
Sample Report	$3,500			
Five Year Site Review		$23,000		Labor and supplies to evaluate site every five years for 5-year review
Asphalt Maintenance	$1,100			Seal asphalt pavement
			$4,500	Mill and replace asphalt pavement every 10 years
SUBTOTAL	$21,695	$23,000	$4,500	
Contingency @ 10%	$2,170	$2,300	$450	
TOTAL	**$23,865**	**$25,300**	**$4,950**	

PORTSMOUTH NAVAL SHIPYARD
Kittery, Maine
OU2 FS
Alternative WDA-3
Present Worth Analysis

Year	Capital Cost	Annual Cost	Total Year Cost	Annual Discount Rate 7.0%	Present Worth
0	$1,210,624		$1,210,624	1.000	$1,210,624
1		$23,865	$23,865	0.935	$22,303
2		$23,865	$23,865	0.873	$20,844
3		$23,865	$23,865	0.816	$19,481
4		$23,865	$23,865	0.763	$18,206
5		$49,165	$49,165	0.713	$35,054
6		$23,865	$23,865	0.666	$15,902
7		$23,865	$23,865	0.623	$14,862
8		$23,865	$23,865	0.582	$13,889
9		$23,865	$23,865	0.544	$12,981
10		$54,115	$54,115	0.508	$27,509
11		$23,865	$23,865	0.475	$11,338
12		$23,865	$23,865	0.444	$10,596
13		$23,865	$23,865	0.415	$9,903
14		$23,865	$23,865	0.388	$9,255
15		$49,165	$49,165	0.362	$17,819
16		$23,865	$23,865	0.339	$8,084
17		$23,865	$23,865	0.317	$7,555
18		$23,865	$23,865	0.296	$7,061
19		$23,865	$23,865	0.277	$6,599
20		$54,115	$54,115	0.258	$13,984
21		$23,865	$23,865	0.242	$5,764
22		$23,865	$23,865	0.226	$5,387
23		$23,865	$23,865	0.211	$5,034
24		$23,865	$23,865	0.197	$4,705
25		$49,165	$49,165	0.184	$9,059
26		$23,865	$23,865	0.172	$4,109
27		$23,865	$23,865	0.161	$3,841
28		$23,865	$23,865	0.150	$3,589
29		$23,865	$23,865	0.141	$3,354
30		$54,115	$54,115	0.131	$7,109
				TOTAL PRESENT WORTH	**$1,565,798**

PORTSMOUTH NAVAL SHIPYARD
Kittery, Maine
OU2 FS
Alternative WDA-3
Capital Cost

Item	Quantity	Unit	Unit Cost Subcontract	Unit Cost Material	Unit Cost Labor	Unit Cost Equipment	Extended Cost Subcontract	Extended Cost Material	Extended Cost Labor	Extended Cost Equipment	Subtotal
1 PROJECT PLANNING & DOCUMENTS											
1.1 Prepare LUC Documents	200	hr			$37.00		$0	$0	$7,400	$0	$7,400
1.2 Prepare Documents & Plans including Permits	300	hr			$37.00		$0	$0	$11,100	$0	$11,100
1.3 Prepare Groundwater Monitoring Plan	100	hr			$37.00		$0	$0	$3,700	$0	$3,700
1.4 Completion Report	60	hr			$37.00		$0	$0	$2,220	$0	$2,220
2 MOBILIZATION AND DEMOBILIZATION											
2.1 Preconstruction Meeting	24	hr			$60.00		$0	$0	$1,440	$0	$1,440
2.2 Site Support Facilities (trailers, phone, electric, etc.)	1	ls		$1,150.00		$3,750.00	$0	$1,150	$0	$3,750	$4,900
2.3 Equipment Mobilization/Demobilization	3	ea			$177.00	$610.00	$0	$0	$531	$1,830	$2,361
3 FIELD SUPPORT											
3.1 Site Support Facilities (trailers, phone, electric, etc.)	2	mo		$275.00	$394.00		$0	$550	$788	$0	$1,338
3.2 Survey Support	3	day	$1,075.00				$3,225	$0	$0	$0	$3,225
3.3 Site Superintendent	35	day		$150.00	$384.64		$0	$5,250	$13,462	$0	$18,712
3.4 Site Health & Safety and QA/QC	35	day		$150.00	$307.68		$0	$5,250	$10,769	$0	$16,019
4 DECONTAMINATION											
4.1 Decontamination Services	1	mo		$1,222.00	$2,250.00	$1,555.00	$0	$1,222	$2,250	$1,555	$5,027
4.2 Equipment Decon Pad	1	ls		$3,850.00	$3,550.00	$820.00	$0	$3,850	$3,550	$820	$8,220
4.3 Decon Water	1,000	gal		$0.20			$0	$200	$0	$0	$200
4.4 Decon Water Storage Tank, 6,000 gallon	1	mo				$781.05	$0	$0	$0	$781	$781
4.5 Clean Water Storage Tank, 4,000 gallon	1	mo				$701.88	$0	$0	$0	$702	$702
4.6 Disposal of Decon Waste (liquid & solid)	1	mo	$975.00				$975	$0	$0	$0	$975
5 EXCAVATION AND DISPOSAL											
5.1 Excavator, 2 cy bucket	10	day			$355.20	$1,321.00	$0	$0	$3,552	$13,210	$16,762
5.2 Site Labor, (3 laborers)	30	day			$264.80		$0	$0	$7,944	$0	$7,944
5.3 Offsite Disposal Soil Testing	4	ea	$575.00	$20.00			$2,300	$80	$0	$0	$2,380
5.4 Off Site Disposal, Non-Hazardous (1.5 tons/cy)	2,903	ton	$75.00				$217,725	$0	$0	$0	$217,725
5.5 Confirmation Sampling, lead, copper, nickel	4	ea	$150.00	$50.00	$60.00	$40.00	$600	$200	$240	$160	$1,200
6 SITE RESTORATION											
6.1 Backfill Soil - Ancillary Areas	156	cy		$19.25			$0	$3,003	$0	$0	$3,003
6.2 Pavement Replacement - Ancillary Areas	1,070	sf	$2.58				$2,761	$0	$0	$0	$2,761
6.3 Geotextile	3,017	sy		$1.50		$0.03	$0	$4,526	$0	$91	$4,616
6.4 Select Fill	1,280	cy		$30.00			$0	$38,400	$0	$0	$38,400
6.5 Topsoil	374	cy		$28.89			$0	$10,805	$0	$0	$10,805
6.6 Pavement Replacement	3,390	sf	$2.58				$8,746	$0	$0	$0	$8,746
6.7 Grade & Seed Cover	2,250	sy		$0.50	$1.67	$0.34	$0	$1,125	$3,758	$765	$5,648
6.8 Excavator, 2 cy	15	day			$355.20	$1,321.00	$0	$0	$5,328	$19,815	$25,143
6.9 Dozer, 300 hp	15	day			$343.60	$1,592.00	$0	$0	$5,154	$23,880	$29,034
6.10 Compactor	15	day			$343.60	$1,243.00	$0	$0	$5,154	$18,645	$23,799
6.11 Site Labor, (3 laborers)	45	day			$264.80		$0	$0	$11,916	$0	$11,916
6.12 Warning Signs	4	ea		$74.00			$0	$296	$0	$0	$296
Subtotal							$236,332	$75,906	$100,256	$86,003	$498,497
Overhead on Labor Cost @ 30%									$30,077		$30,077
G & A on Labor Cost @ 10%									$10,026		$10,026
G & A on Material Cost @ 10%								$7,591			$7,591
G & A on Equipment Cost @ 10%										$8,600	$8,600
G & A on Subcontract Cost @ 10%							$23,633				$23,633
Tax on Materials and Equipment Cost @ 5%								$3,795		$4,300	$8,095
Total Direct Cost							$259,965	$87,292	$140,358	$98,904	$586,519

Item	Quantity	Unit	Unit Cost Subcontract	Unit Cost Material	Unit Cost Labor	Unit Cost Equipment	Extended Cost Subcontract	Extended Cost Material	Extended Cost Labor	Extended Cost Equipment	Subtotal
Indirects on Total Direct Cost @ 25%	(excluding transportation and disposal cost)										$146,086
Profit on Total Direct Cost @ 10%											$58,652
Subtotal											$791,257
Health & Safety Monitoring @ 2%											$15,825
Total Field Cost											$807,082
Contingency on Total Field Costs @ 30%											$242,125
Engineering on Total Field Cost @ 20%											$161,416
TOTAL CAPITAL COST											**$1,210,624**

CLIENT:	PORTSMOUTH NAVAL SHIPYARD	JOB NUMBER:	112G00924 - 0000.0801
SUBJECT:	OU2 FS - VOLUME CALCULATION FOR WASTE DISPOSAL AREA ALTERNATIVES		
BASED ON:	FS Figures 4-1 Through 4-4	DRAWING NUMBER:	
BY: LW Date: 2-25-2011	CHECKED BY: Date: Rev 2/25/11	APPROVED BY:	DATE:

Alternative WDA-3 Alternative WDA-3 includes excavation of 2 feet of material form the area identified as the proposed cover area on Figure 4-2 provided as page 8 of 10 in this calculation. Alternative WDA-3 also include the excavation of ancillary areas identified on Figure 4-2. All excavated soil will be characterized and disposed off-site. The ancillary excavation areas will be backfilled to existing grade and surface conditions will be returned. The area identified as the proposed cover system area will be backfilled with cover material to reestablish existing elevations and existing surface conditions (page 9 of 10). The following presents the volumes quantities of materials involved in the excavation and cover construction process.

Ancillary Area 1 Excavation Area (Surface) =	260 sf (vertical side slope)
Ancillary Area 1 Excavation Depth =	1 ft
Ancillary Area 1 Excavation Area (Bottom) =	260 sf
Volume of Material in Ancillary Area 1 =	10 cy
Ancillary Area 2 Excavation Area (Surface) =	130 sf (vertical side slope)
Ancillary Area 2 Excavation Depth =	1 ft
Ancillary Area 2 Excavation Area (Bottom) =	130 sf
Volume of Material in Ancillary Area 2 =	5 cy
Ancillary Area 3 Excavation Area (Surface) =	260 sf (vertical side slope)
Ancillary Area 3 Excavation Depth =	1 ft
Ancillary Area 3 Excavation Area (Bottom) =	260 sf
Volume of Material in Ancillary Area 3 =	10 cy
Ancillary Area 4 Excavation Area (Surface) =	1,070 sf (2H:1V side slope)
Ancillary Area 4 Excavation Depth =	8 ft
Ancillary Area 4 Excavation Area (Bottom) =	20 sf
Volume of Material in Ancillary Area 4 =	161 cy
Proposed cover system area =	23,611 sf
Proposed cover system area excavation depth =	2 ft
Volume of Material removed form proposed cover system area =	1,749 cy
Total Volume of Material Excavated and Disposed Off-site =	1,935 cy

Confirmation samples will be collected from the floor and sidewalls of any excavation that is outside of the proposed cover system. Assume 1 composite sample from each ancillary area.

Number of Confirmation Samples = 4 samples

Characterization sampling for off-site disposal will be collected at a rate of 1 sample for every 500 cy of material going off-site for disposal.

Number of Characterization Samples = 4 samples

CLIENT:	PORTSMOUTH NAVAL SHIPYARD		JOB NUMBER:	112G00924 - 0000.0801
SUBJECT:	OU2 FS - VOLUME CALCULATION FOR WASTE DISPOSAL AREA ALTERNATIVES			
BASED ON:	FS Figures 4-1 Through 4-4		DRAWING NUMBER:	
BY: LW Date: 2-25-2011		CHECKED BY: Date: DCW 2/25/11	APPROVED BY:	DATE:

Following excavation and off-site disposal ancillary areas will need to be backfilled and the cover system materials will need to be placed. The Following calculations presents the volume of material needed to backfill the ancillary excavation Ares and the volume of material needed to construct the cover system.

Volume of Backfill Material for Ancillary Area 1 =	10 cy
Volume of Backfill Material for Ancillary Area 2 =	5 cy
Volume of Backfill Material for Ancillary Area 3 =	10 cy
Volume of Backfill Material for Ancillary Area 4 =	161 cy
Area of pavement =	1,070 sf
Top 9-inches asphalt pavement =	30 cy
Volume of Backfill Material for Ancillary Area 4 =	132 cy
Total Volume of Backfill soil for Ancillary Areas =	156 cy
Total Area of Pavement to restore for Ancillary Areas =	1,070 sf (9-inch thick section)
Area of proposed cover system =	23,611 sf
Area to be vegetated =	20,221 sf
Area to be paved (9-inch-thick section) =	3,390 sf
Volume of asphalt material =	94 cy
Area of geotextile needed for cover system (15% overlap) =	3,017 sy
Volume of Select fill for cover system =	1,280 cy
Volume of topsoil for cover system (6" thick) =	374 cy

Volume of select fill equals the sum of 15-inch-thick under pavement and 18-inch-thick under vegetation areas.

Alternative WDA-3 also includes the implementation of LUCs, groundwater monitoring, and offshore sediment accumulation monitoring. With the consolidation of the Waste Disposal Area, the LUC area differs from the area reported for Alternative WDA-2. The following calculates the LUC area for WDA-3.

Area of the LUC limits on Fig. 4-2 =	10.8 si
Figure Scale =	50 ft per 1 inch
Area of the LUC limits on Fig. 4-2 =	27,000 sf

Perimeter warning signs are to be installed every 200 feet along the perimeter of the waste disposal area. Where the area is paved signs are to be installed in the grass.

LUC limit perimeter =	765 ft
Sign spacing =	200 ft
Number of perimeter warning signs =	4 signs

Operation and Maintenance (O&M) is required for the LUCs and the Cover area. O&M includes annual inspection and maintenance to the existing pavement (asphalt) and replacing the pavement every 10 years.

CLIENT:	PORTSMOUTH NAVAL SHIPYARD	JOB NUMBER:	112G00924 - 0000.0801
SUBJECT:	OU2 FS - VOLUME CALCULATION FOR WASTE DISPOSAL AREA ALTERNATIVES		
BASED ON:	FS Figures 4-1 Through 4-4	DRAWING NUMBER:	
BY: LW Date: 2-25-2011	CHECKED BY: RLW 2/25/11 Date:	APPROVED BY:	DATE:

Area of asphalt within LUC limits = 3,390 sf

Groundwater monitoring consists of sampling five existing wells annually for 30 years and analysis of the groundwater samples for lead, copper, and nickel.

Offshore sediment accumulation monitoring would be conducted annually along the length of OU2 but sampling and analysis of any identified sediment would not be performed under OU2.

Five year reviews are also required under this alternative.

Alternative WDA-4

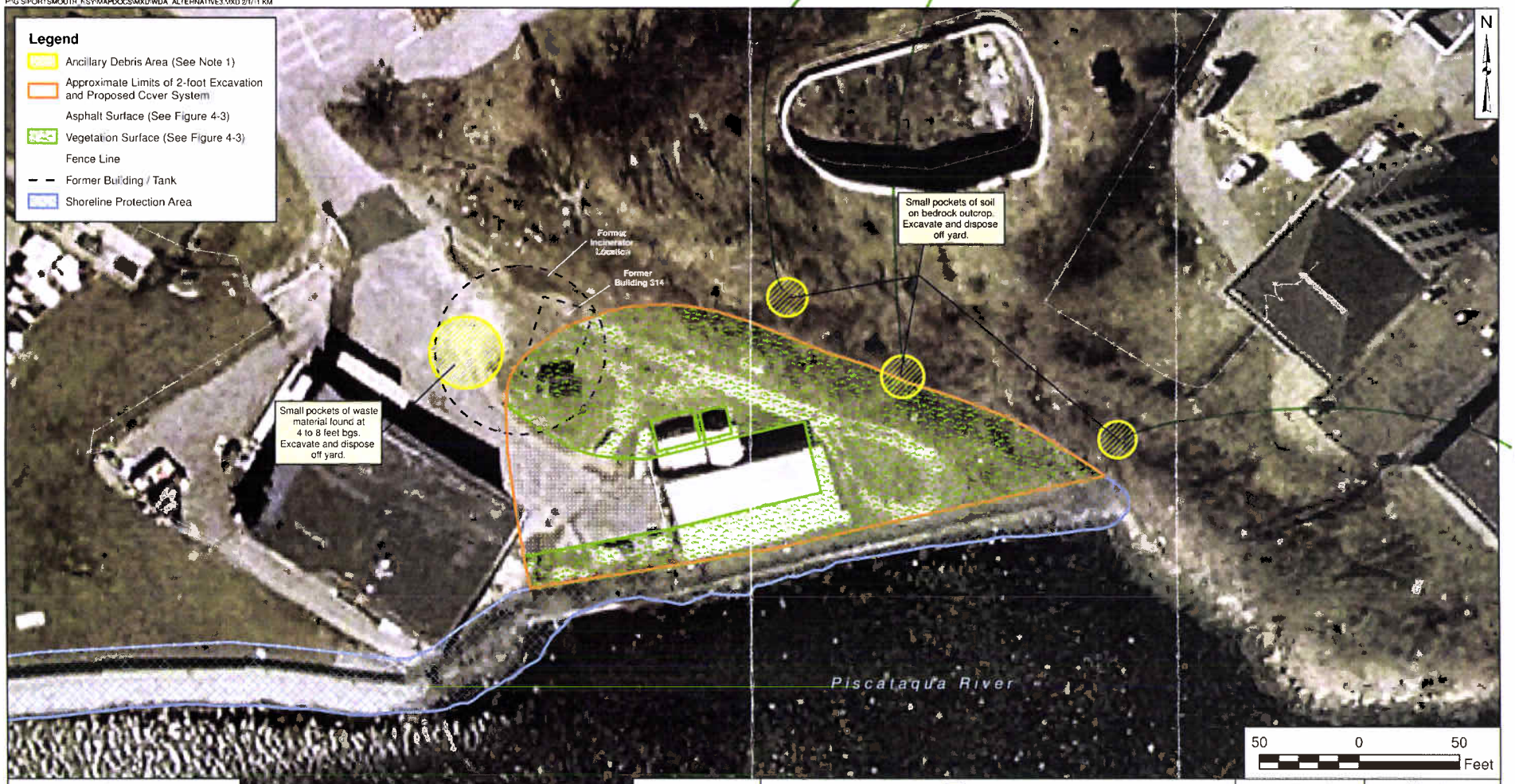
Alternative WDA-4 includes excavation of 6 feet of material form the area identified as the proposed cover area on Figure 4-4 provided as page 10 of 10 in this calculation. Alternative WDA-4 also include the excavation of ancillary areas identified on Figure 4-4. All excavated soil will be characterized and disposed off-site. The ancillary excavation areas will be backfilled to existing grade and surface conditions will be returned. The area identified as the proposed cover system area will be backfilled with select fill from 2 to 6 ft bgs and then the same cover material as WDA-3 from 0 to 2 ft bgs to reestablish existing elevations and existing surface conditions (page 9 of 10). The following presents the volumes quantities of materials involved in the excavation and cover construction process.

Ancillary Area 1 Excavation Area (Surface) =	260 sf (vertical side slope)
Ancillary Area 1 Excavation Depth =	1 ft
Ancillary Area 1 Excavation Area (Bottom) =	260 sf
Volume of Material in Ancillary Area 1 =	10 cy
Ancillary Area 2 Excavation Area (Surface) =	130 sf (vertical side slope)
Ancillary Area 2 Excavation Depth =	1 ft
Ancillary Area 2 Excavation Area (Bottom) =	130 sf
Volume of Material in Ancillary Area 2 =	5 cy
Ancillary Area 3 Excavation Area (Surface) =	260 sf (vertical side slope)
Ancillary Area 3 Excavation Depth =	1 ft
Ancillary Area 3 Excavation Area (Bottom) =	260 sf
Volume of Material in Ancillary Area 3 =	10 cy
Ancillary Area 4 Excavation Area (Surface) =	1,070 sf (2H:1V side slope)
Ancillary Area 4 Excavation Depth =	8 ft
Ancillary Area 4 Excavation Area (Bottom) =	20 sf
Volume of Material in Ancillary Area 4 =	161 cy
Proposed cover system area =	23,611 sf
Proposed cover system area excavation depth =	6 ft
Volume of Material removed form proposed cover system area =	5,247 cy

area 1

area 3

P:\G\S\PORTSMOUTH_NSY\MAPDOCS\MXD\WDA_ALTERNATIVE3.MXD 2/1/11 KM



area

Aerial Photo Source:
Imagery from the Maine Office of Geographic Information Systems. Photo taken September 2008

Notes:
1.) Remove and dispose off yard material within ancillary debris area.
2.) Re-establish surface conditions.
3.) Install perimeter signs.
4.) All excavated material to be transported and disposed in an approved off yard facility.

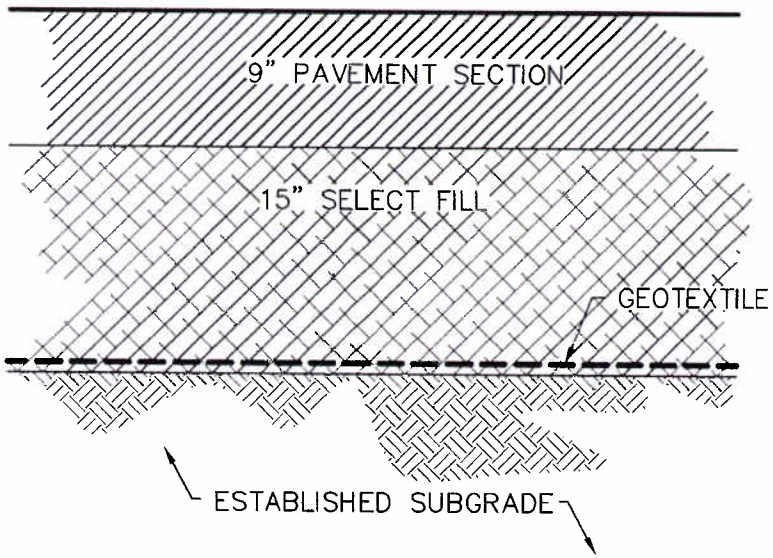
DRAWN BY / DATE	T. WHEATON 11/11/10
CHECKED BY / DATE	J. SPEAKMAN 2/1/11
COST/SCHEDULE-AREA	
SCALE	AS NOTED

TETRA TECH

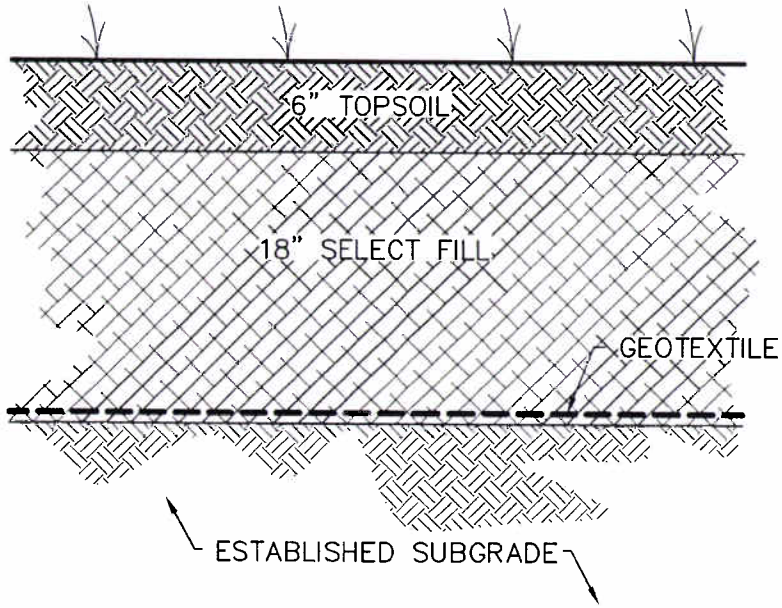
WASTE DISPOSAL AREA
ALTERNATIVE WDA-3
OPERABLE UNIT 2 FEASIBILITY STUDY REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

CONTRACT NUMBER	0924
OWNER NUMBER	CTO 444
APPROVED BY / DATE	— / —
APPROVED BY / DATE	— / —
FIGURE NO.	FIGURE 4-2
REV	0

ACAD: 0924F01.dwg 12/10/10 CK



PAVEMENT SECTION
NOT TO SCALE



VEGETATIVE SECTION
NOT TO SCALE

DRAWN BY BH DATE 11/10/08	Tetra Tech NUS, Inc.	TYPICAL COVER SYSTEM DETAILS OPERABLE UNIT 2 FEASIBILITY STUDY REPORT 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 4-3 / REV. 0

PORTSMOUTH NAVAL SHIPYARD
Kittery, Maine
OU2 FS
Alternative DRMO-4
Capital Cost

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Item	Quantity	Unit	Unit Cost Subcontract	Unit Cost Material	Unit Cost Labor	Unit Cost Equipment	Extended Cost Subcontract	Extended Cost Material	Extended Cost Labor	Extended Cost Equipment	Subtotal
1 PROJECT PLANNING & DOCUMENTS											
1.1 Prepare LUC Documents	200	hr			$37.00		$0	$0	$7,400	$0	$7,400
1.2 Prepare Documents & Plans including Permits	250	hr			$37.00		$0	$0	$9,250	$0	$9,250
1.3 Prepare Groundwater Monitoring Plan	100	hr			$37.00		$0	$0	$3,700	$0	$3,700
1.4 Completion Report	200	hr			$37.00		$0	$0	$7,400	$0	$7,400
2 MOBILIZATION AND DEMOBILIZATION											
2.1 Preconstruction Meeting	24	hr			$60.00		$0	$0	$1,440	$0	$1,440
2.2 Site Support Facilities (trailers, phone, electric, etc.)	1	ls		$1,150.00		$3,750.00	$0	$1,150	$0	$3,750	$4,900
2.3 Equipment Mobilization/Demobilization	6	ea			$177.00	$610.00	$0	$0	$1,062	$3,660	$4,722
3 FIELD SUPPORT											
3.1 Site Support Facilities (trailers, phone, electric, etc.)	6	mo		$275.00	$394.00		$0	$1,650	$2,364	$0	$4,014
3.2 Survey Support	6	day	$1,075.00				$6,450	$0	$0	$0	$6,450
3.3 Site Superintendent	125	day		$150.00	$384.64		$0	$18,750	$48,080	$0	$66,830
3.4 Site Health & Safety and QA/QC	125	day		$150.00	$307.68		$0	$18,750	$38,460	$0	$57,210
4 DECONTAMINATION											
4.1 Decontamination Services	3	mo		$1,222.00	$2,250.00	$1,555.00	$0	$3,666	$6,750	$4,665	$15,081
4.2 Equipment Decon Pad	2	ea		$3,850.00	$3,550.00	$820.00	$0	$7,700	$7,100	$1,640	$16,440
4.3 Decon Water	3,000	gal		$0.20			$0	$600	$0	$0	$600
4.4 Decon Water Storage Tank, 6,000 gallon	3	mo				$781.05	$0	$0	$0	$2,343	$2,343
4.5 Clean Water Storage Tank, 4,000 gallon	3	mo				$710.88	$0	$0	$0	$2,133	$2,133
4.6 Disposal of Decon Waste (liquid & solid)	3	mo	$975.00				$2,925	$0	$0	$0	$2,925
5 EXCAVATION AND DISPOSAL											
5.1 Excavator, 2 cy bucket (2 each)	136	day			$355.20	$1,321.00	$0	$0	$48,307	$179,656	$227,963
5.2 Site Labor, (3 laborers)	204	day			$264.80		$0	$0	$54,019	$0	$54,019
5.3 Verification Sampling	24	ea	$575.00	$20.00			$13,800	$480	$0	$0	$14,280
5.4 Off Site Disposal, Non-Hazardous (1.5 tons/cy)	10,801	ton	$75.00				$810,075	$0	$0	$0	$810,075
5.5 Off Site Disposal, Hazardous (1.5 tons/cy)	6,620	ton	$255.00				$1,688,100	$0	$0	$0	$1,688,100
5.6 Confirmation Sampling, lead, copper, nickel	3	ea	$150.00	$50.00	$60.00	$40.00	$450	$150	$180	$120	$900
6 SITE RESTORATION											
6.1 Select Fill	10,421	cy		$30.00			$0	$312,630	$0	$0	$312,630
6.2 Topsoil	510	cy		$38.20			$0	$19,482	$0	$0	$19,482
6.3 Pavement Replacement	24,740	sf	$2.56				$63,829	$0	$0	$0	$63,829
6.4 Topsoil - grade, seed, fertilizer	3,060	sy	$3.48				$10,649	$0	$0	$0	$10,649
6.5 Replacement Geotextile	440	sy		$1.50		$0.03	$0	$660	$0	$13	$673
6.6 Replacement Base Stone	145	cy		$38.00			$0	$5,510	$0	$0	$5,510
6.7 Replacement Riprap	50	ton		$30.50			$0	$1,525	$0	$0	$1,525
6.8 Excavator, 2 cy bucket	37	day			$355.20	$1,321.00	$0	$0	$13,142	$48,877	$62,019
6.9 Dozer, 300 hp	37	day			$343.60	$1,592.00	$0	$0	$12,713	$58,904	$71,617
6.10 Compactor	37	day			$343.60	$1,243.00	$0	$0	$12,713	$45,991	$58,704
6.11 Site Labor, (3 laborers)	111	day			$264.80		$0	$0	$29,393	$0	$29,393
6.12 Warning Signs	12	ea		$74.00			$0	$888	$0	$0	$888
Subtotal							$2,596,278	$393,591	$303,474	$351,752	$3,645,095
Overhead on Labor Cost @ 30%									$91,042		$91,042
G & A on Labor Cost @ 10%									$30,347		$30,347
G & A on Material Cost @ 10%								$39,359			$39,359
G & A on Equipment Cost @ 10%										$35,175	$35,175
G & A on Subcontract Cost @ 10%							$259,628				$259,628
Tax on Materials and Equipment Cost @ 5%								$19,680		$17,588	$37,267

Item	Quantity	Unit	Unit Cost Subcontract	Unit Cost Material	Unit Cost Labor	Unit Cost Equipment	Extended Cost Subcontract	Extended Cost Material	Extended Cost Labor	Extended Cost Equipment	Subtotal
Total Direct Cost							$2,855,906	$452,630	$424,864	$404,515	$4,137,914
Indirects on Total Direct Cost @ 30%			(excluding transportation and disposal cost)								$491,044
Profit on Total Direct Cost @ 10%											$413,791
Subtotal											$5,042,749
Health & Safety Monitoring @ 1%											$50,427
Total Field Cost											$5,093,177
Contingency on Total Field Costs @ 20%											$1,018,635
Engineering on Total Field Cost @ 5%											$254,659
TOTAL CAPITAL COST											**$6,366,471**

PORTSMOUTH NAVAL SHIPYARD
Kittery, Maine
OU2 FS
Alternative DRMO-4
Annual Cost

3/29/2011 3:48 PM

Item	Item Cost years 1 - 5	Item Cost years 6 - 30	Item Cost every 5 years	Item Cost every 10 years	Notes
Annual Site Inspection & Report	$2,700	$2,700			Labor and supplies once a year to inspect Land Use Controls with Report.
Sample Collection	$13,975				Collect 5 groundwater samples & measure sediment thickness from boat in years 1 to 5.
		$12,475			Collect 2 groundwater samples & measure sediment thickness from boat in years 6 to 30
Sample Analysis	$420	$168			Analysis samples for lead, copper, & nickel. Collect samples once a year for 30 years.
Sample Report	$3,500	$3,500			
Asphalt Maintenance	$28,500	$28,500			Seal asphalt pavement
				$121,000	Mill and replace asphalt pavement every 10 years
Five Year Site Review			$23,000		Labor and supplies to evaluate site every five years for 5-year review
SUBTOTAL	$49,095	$47,343	$23,000	$121,000	
Contingency @ 10%	$4,910	$4,734	$2,300	$12,100	
TOTAL	**$54,005**	**$52,077**	**$25,300**	**$133,100**	

PORTSMOUTH NAVAL SHIPYARD
Kittery, Maine
OU2 FS
Alternative DRMO-4
Present Worth Analysis

Year	Capital Cost	Annual Cost	Total Year Cost	Annual Discount Rate 7.0%	Present Worth
0	$6,366,471		$6,366,471	1.000	$6,366,471
1		$54,005	$54,005	0.935	$50,471
2		$54,005	$54,005	0.873	$47,170
3		$54,005	$54,005	0.816	$44,084
4		$54,005	$54,005	0.763	$41,200
5		$79,305	$79,305	0.713	$56,543
6		$52,077	$52,077	0.666	$34,701
7		$52,077	$52,077	0.623	$32,431
8		$52,077	$52,077	0.582	$30,309
9		$52,077	$52,077	0.544	$28,327
10		$210,477	$210,477	0.508	$106,996
11		$52,077	$52,077	0.475	$24,742
12		$52,077	$52,077	0.444	$23,123
13		$52,077	$52,077	0.415	$21,610
14		$52,077	$52,077	0.388	$20,196
15		$77,377	$77,377	0.362	$28,045
16		$52,077	$52,077	0.339	$17,640
17		$52,077	$52,077	0.317	$16,486
18		$52,077	$52,077	0.296	$15,408
19		$52,077	$52,077	0.277	$14,400
20		$210,477	$210,477	0.258	$54,391
21		$52,077	$52,077	0.242	$12,577
22		$52,077	$52,077	0.226	$11,755
23		$52,077	$52,077	0.211	$10,986
24		$52,077	$52,077	0.197	$10,267
25		$77,377	$77,377	0.184	$14,257
26		$52,077	$52,077	0.172	$8,967
27		$52,077	$52,077	0.161	$8,381
28		$52,077	$52,077	0.150	$7,833
29		$52,077	$52,077	0.141	$7,320
30		$210,477	$210,477	0.131	$27,650
				TOTAL PRESENT WORTH	**$7,194,737**

CLIENT: PORTSMOUTH NAVAL SHIPYARD		JOB NUMBER: 112G00924 - 0000.0801	
SUBJECT: OU2 FS - VOLUME CALCULATION FOR DRMO AREA ALTERNATIVES			
BASED ON: FS Figures 4-5 Through 4-9		DRAWING NUMBER:	
BY: LW Date: 2-25-2011	CHECKED BY: DKW 2/25/11 Date:	APPROVED BY:	DATE:

Perimeter warning signs are to be installed every 200 feet along the perimeter of Building 298.

LUC limit perimeter =	360 ft
Sign spacing =	200 ft
Number of perimeter warning signs =	2 signs

O&M is required for the DRMO area LUCs. O&M includes annual inspection and maintenance to Building 298. The pavement area would also need to be inspected annually and replaced every 10 years.

Area of asphalt pavement =	116,438 sf

Groundwater monitoring consists of sampling 2 existing wells annually for 30 years and analysis of the groundwater samples for lead, copper, and nickel.

Offshore sediment accumulation monitoring is NOT needed under this alternative.

Five year reviews are also required under this alternative.

Alternative DRMO-3A

Alternative DRMO-3A is identical to Alternative DRMO-3 with the exception of bringing in a screen and soil washing unit to reduce the amount of fill material that needs to go off yard for disposal and to reduce the volume of required backfilling material. The following summarizes the volume changes for off yard disposal and backfilling.

Based on pilot studies, it is estimated that the screening and soil washing process will reduce the volume of soil going off yard for disposal to by approximately 40 percent.

Volume of Off Yard Disposal Material =	31,995 cy
Percent Reduction =	40 %
Reduced Off Yard Disposal Volume =	19,197 cy
Volume available for select fill backfilling (i.e. washed soil)=	12,798 cy
Reduced purchased Select Fill Volume =	15,453 cy
Estimated water volume needed treatment =	150,000 gallons

Required water treatment includes filtration.

Alternative DRMO-4

Alternative DRMO-4 includes the excavation (estimated depth 6 feet) and off-yard disposal of the contaminated material that is causing an unacceptable construction worker risk within the limits of the DRMO (including the existing interim cap area), with the exception of Bldg 298 (Refer to Figure 4-7 provided as page 10 of 12 in this calculations). Following excavation and off yard disposal, the excavation areas will be backfilled to establish pre-construction grades, elevations, and surface types using clean soil and pavement where necessary.

west of DRMO area (paved) =	20,590 sf

CLIENT:	PORTSMOUTH NAVAL SHIPYARD	JOB NUMBER:	112G00924 - 0000.0801
SUBJECT:	OU2 FS - VOLUME CALCULATION FOR DRMO AREA ALTERNATIVES		
BASED ON:	FS Figures 4-5 Through 4-9	DRAWING NUMBER:	
BY: LW Date: 2-25-2011	CHECKED BY: Date: DCW 2/25/11	APPROVED BY:	DATE:

area between interim cap and Bld 298 (paved) = 4,150 sf
existing interim cap area (unpaved) = 27,540 sf

Depth of Excavation = 6 ft

Total Volume to be Excavated and Disposed Off-yard = 11,618 cy

Confirmation samples will be collected from the floor and sidewalls of the excavation areas. Assume a total of 3 confirmation samples will be collected.

Number of Confirmation Samples = 3 samples

Characterization sampling for off-site disposal will be collected at a rate of 1 sample for every 500 cy of material going off-site for disposal.

Number of Characterization Samples = 24 samples

Following excavation and off yard disposal the excavation areas will need to be backfilled and the existing surface conditions will need to be restored.

Area to receive clean fill and top soil for seeding (interim cap area) = 27,540 sf
Clean fill thickness = 5.5 ft
Volume of clean fill needed = 5,610 cy
Volume of top 6 in clean soil for seeding = 510 cy

Area of 9-inch-thick pavement (previously paved area) = 24,740 sf
Pavement Thickness (top 9 inch) = 0.75 ft
Clean Fill Thickness = 5.25 ft
Volume of pavement needed = 687 cy
Volume of clean fill needed = 4,811 cy

Total pavement area needed = 24,740 sf
Total clean fill volume needed = 10,421 cy
Total clean top soil volume needed = 510 cy

Following site restoration, LUCs will need to be developed and implemented over the entire DRMO area.

Land use control area for Alternative DRMO-4.

Area of the LUC limits on Fig. 4-7 = 18.755 si
Figure Scale = 90 ft per 1 inch
Area of the LUC limits on Fig. 4-7 = 151,916 sf

Perimeter warning signs are to be installed every 200 feet along the perimeter of Building 298.

LUC limit perimeter = 2205 ft
Sign spacing = 200 ft
Number of perimeter warning signs = 12 signs

CLIENT:	PORTSMOUTH NAVAL SHIPYARD	JOB NUMBER:	112G00924 - 0000.0801
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BASED ON:	FS Figures 4-5 Through 4-9	DRAWING NUMBER:	
BY: LW Date: 2-25-2011	CHECKED BY: Date: DCW 2/25/11	APPROVED BY:	DATE:

O&M is required for the DRMO area LUCs. O&M includes annual inspection and maintenance to the existing and new pavement (asphalt) and replacing the pavement every 10 years.

Total area of existing and new asphalt pavement = 116,438 sf

Groundwater monitoring consists of sampling 2 existing wells down gradient of Building 298 annually for 30 years and 3 existing wells in the DRMO area annually for 5 years. The groundwater samples will be analyzed for lead, copper, and nickel.

Offshore sediment accumulation monitoring would be conducted annually along the length of OU2 but sampling and analysis of any identified sediment would not be performed under OU2.

Five year reviews are also required under this alternative.

Alternative DRMO-4A

Alternative DRMO-4A is identical to Alternative DRMO-4 with the exception of bringing in a screen and soil washing unit to reduce the amount of fill material that needs to go off yard for disposal and to reduce the volume of required backfilling material. The following summarizes the volume changes for off yard disposal and backfilling.

Based on pilot studies, it is estimated that the screening and soil washing process will reduce the volume of soil going off yard for disposal to by approximately 40 percent.

Volume of Off Yard Disposal Material =	11,618 cy
Percent Reduction =	40 %
Reduced Off Yard Disposal Volume =	6,971 cy
Volume available for select fill backfilling =	4,647 cy
Reduced purchased Select Fill Volume =	5,773 cy
Estimated water volume needed treatment =	60,000 gallons

Required water treatment includes filtration.

Alternative DRMO-5

Alternative DRMO-5 consists of excavation and off-yard disposal of soil that is causing an unacceptable risk based on construction worker exposure, constructing a permanent RCRA C cap system over the area where the current interim cap is constructed (See Figure 4-8, provided as page 11 of 12 in this calculations), LUCs, groundwater monitoring, and offshore sediment accumulation monitoring.

The identified area in the west of the DRMO area and the area between the interim cap and Building 298 will be excavated to an average depth of 6 ft.

area in west of DRMO area (paved) =	20,590 sf
area between interim cap and Bld 298 (paved) =	4,150 sf

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SUBJECT: OU2 FS - VOLUME CALCULATION FOR DRMO AREA ALTERNATIVES			
BASED ON: FS Figures 4-5 Through 4-9			DRAWING NUMBER:
BY:	LW	CHECKED BY:	APPROVED BY: DATE:
Date:	2-25-2011	Date: PKW 2/25/11	

Shoreline Revetment Removal/Replacement

For Alternatives DRMO-3(A), DRMO-4(A), and DRMO-5(A), a portion of the shoreline revetment adjacent to the proposed excavation areas would need to be removed and replaced. The following summarizes the length of shoreline revetment that would need to be removed and replaced.

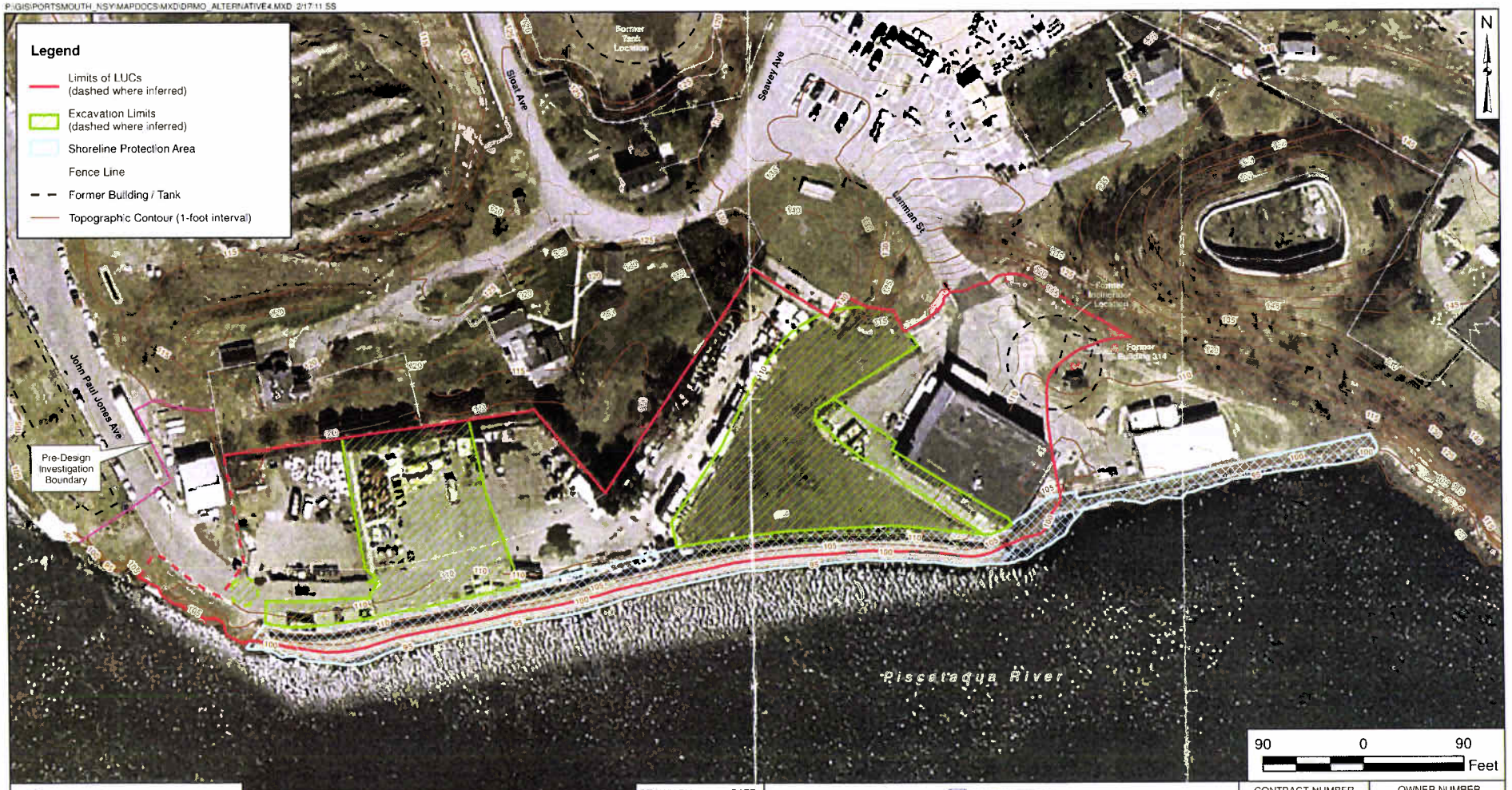
Alternative DRMO-3(A)= 750 lf

Alternative DRMO-4(A)= 650 lf

Alternative DRMO-5(A)= 650 lf

It was assumed that the depth of the shoreline excavation would extend to approximately 6 feet bgs for each of the DRMO alternatives evaluated.

P:\GIS\PORTSMOUTH_NSY\MAPDOCS\MXD\DRMO_ALTERNATIVE4.MXD 2/17/11 SS



Aerial Photo Source:
Imagery from the Maine Office of Geographic Information Systems. Photo taken September 2008.

Notes:
1.) Excavated material to be disposed off yard.
2.) Backfill excavation area with clean backfill to re-establish existing ground surface conditions.
3.) Re-establish existing fence lines removed for excavation and install perimeter signs.

DRAWN BY T. WHEATON	DATE 11/11/10
CHECKED BY J. SPEAKMAN	DATE 2/17/11
COST/SCHEDULE-AREA	
SCALE AS NOTED	

TETRA TECH

DRMO AREA
ALTERNATIVE DRMO-4
OPERABLE UNIT 2 FEASIBILITY STUDY REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

CONTRACT NUMBER 0924	OWNER NUMBER CTO 444
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO. FIGURE 4-7	REV 0