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FY07 Amended Site Management Plan

for

Portsmouth Naval Shipyard

Kittery, Maine

Naval Facilities Engineering Command Mid-Atlantic

MAY 2007

FY07 REVISION 1

FY07 AMENDED
SITE MANAGEMENT PLAN
FOR
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

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TABLE OF CONTENTS

SECTION			PAGE NO.
1.0	INTRODUCTION		1-1
	1.1	FACILITY LOCATION AND MISSION	1-1
	1.2	HISTORY OF HAZARDOUS WASTE DISPOSAL, ENVIRONMENTAL INVESTIGATION, AND REMEDIATION ACTIVITIES	1-5
	1.2.1	Onshore Studies	1-6
	1.2.2	Offshore Studies	1-7
	1.2.3	Operable Units	1-9
	1.3	REPORT ORGANIZATION	1-9
2.0	SITE DESCRIPTIONS		2-1
	2.1	OPERABLE UNIT DESCRIPTIONS	2-1
	2.2	SITE DESCRIPTIONS	2-3
	2.2.1	Site 10 - Former Battery Acid Tank No. 24	2-3
	2.2.2	Site 21 – Former Acid/Alkaline Drain Tank	2-3
	2.2.3	Site 6 - Defense Reutilization and Marketing Office Storage Yard (DRMO)	2-4
	2.2.4	Site 29 – Former Teepee Incinerator Site	2-5
	2.2.5	Site 8 - Jamaica Island Landfill (JILF)	2-5
	2.2.6	Site 9 - Former Mercury Burial Site I and Mercury Burial Site II (MBI and MBII)	2-6
	2.2.7	Site 11 - Former Waste Oil Tanks Nos. 6 and 7	2-7
	2.2.8	Site 5 – Former Industrial Waste Outfalls	2-8
	2.2.9	Site 26 - Portable Oil/Water Tanks	2-8
	2.2.10	Offshore Areas	2-8
	2.2.11	Site 27 - Berth 6 Industrial Area (formerly Fuel Oil Spill Area)	2-9
	2.3	SITE SCREENING AREAS	2-9
	2.3.1	Site 30 - Galvanizing Plant, Building 184	2-10
	2.3.2	Site 31 - West Timber Basin	2-10
	2.3.3	Site 32 - Topeka Pier Site	2-10
	2.3.4	Site 34 – Former Oil Gasification Plant, Building 62	2-10
3.0	REGULATORY PROCESS ACTIVITIES		3-1
	3.1	CERCLA PROCESS ACTIVITIES	3-3
	3.1.1	Preliminary Assessment/Site Investigation (PA/SI) and Site Screening Process (SSP)	3-3
	3.1.2	Remedial Investigation/Feasibility Study (RI/FS)	3-3
	3.1.3	Removal Action	3-4
	3.1.4	Interim Remedial Action	3-4
	3.1.5	Remedial Design/Remedial Action (RD/RA)	3-5
4.0	SITE RANKING		4-1
	4.1	RELATIVE RISK SITE EVALUATION FRAMEWORK	4-1
	4.2	SUMMARY OF SITE RISK RANKING FOR PNS	4-2
5.0	SCHEDULE		5-1
	5.1	SCHEDULE DEVELOPMENT	5-1
	5.2	SCHEDULE DURATIONS	5-1
6.0	DOCUMENTS		6-1
	6.1	DOCUMENTS COMPLETED BEFORE SIGNATURE OF FFA	6-1
	6.2	DOCUMENTS COMPLETED AFTER SIGNATURE OF FFA	6-3

TABLE OF CONTENTS (Continued)

SECTION PAGE NO.

7.0 REFERENCES 7-1

APPENDICES

A DEFENSE ENVIRONMENTAL CLEANUP PROGRAM FACT SHEETS
B PNS RELATIVE RISK SITE EVALUATION RANKING WORKSHEETS
C SCHEDULES
D SITE UPDATE FACT SHEET

TABLES

NUMBER PAGE NO.

3-1 RCRA and CERCLA Corrective Action Processes 3-2
4-1 Relative Risk Ranking Results 4-3

FIGURES

NUMBER PAGE NO.

1-1 Great Bay Estuary and Site Location 1-2
1-2 Facility Site Map (Conditions as of September 1999) 1-3

ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
ARAR	Applicable or Relevant and Appropriate Requirement
CDC	Child Development Center
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CHF	Contaminant Hazard Factor
CIA	Controlled Industrial Area
CMI	Corrective Measures Implementation
CMS	Corrective Measures Study
DERP	Defense Environmental Restoration Program
DOD	Department of Defense
DRMO	Defense Reutilization and Marketing Office Storage Yard
EE/CA	Engineering Evaluation/Cost Analysis
EERA	Estuarine Ecological Risk Assessment
ESD	Explanation of Significant Difference
FCS	Final Confirmation Study
FFA	Federal Facility Agreement
FS	Feasibility Study
GCL	Geocomposite clay liner
HHRA	Human Health Risk Assessment
HRS	Hazard Ranking System
HSWA	Hazard and Solid Waste Amendments (of 1984)
IAG	Interagency Agreement
IAS	Initial Assessment Study
IM	Interim Measure
IR	Installation Restoration
JILF	Jamaica Island Landfill
MB	Mercury Burial
MEDEP	Maine Department of Environmental Protection
MEK	Methyl ethyl ketone
MILCON	Military Construction
MPF	Migration Pathway Factor
MPS	Media Protection Standard
MTADS	Multi-sensor Towed Array Detection System
NACIP	Navy Assessment and Control of Installation Pollutants
NAVFAC	Navy Facilities Engineering Command

ACRONYMS AND ABBREVIATIONS (CONT'D)

Navy	United States Department of the Navy
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priority List
NRL	Navy Research Laboratory
OU	Operable Unit
PA/SI	Preliminary Assessment/Site Investigation
PCB	Polychlorinated biphenyl
PHERE	Public Health and Environmental Risk Evaluation
PNS	Portsmouth Naval Shipyard
PP	Proposed Plan
PRAP	Proposed Remedial Action Plan
PRG	Preliminary Remediation Goal
RA	Remedial Action
RAB	Restoration Advisory Board
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RF	Receptor Factor
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
ROD	Record of Decision
SMP	Site Management Plan
SSA	Site Screening Area
SSP	Site Screening Process
SWMU	Solid Waste Management Unit
TCE	Trichloroethene
USEPA	United States Environmental Protection Agency
UST	Underground storage tank
WWII	World War II

1.0 INTRODUCTION

This Site Management Plan (SMP) for Portsmouth Naval Shipyard (PNS) in Kittery, Maine was prepared by the United States Department of the Navy (Navy), Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic. The SMP serves as a management tool for planning, reviewing and setting priorities for all environmental investigative and remedial response activities to be conducted at the facility within the Navy/Marine Corps Installation Restoration (IR) Program. Ultimately, the SMP serves as the schedule for implementation of the IR Program at PNS. The SMP is updated annually to revise priorities and schedules of activities as additional information (including funding) becomes available. This version of the SMP presents the rationale for the sequence of future investigation and remediation activities and the estimated schedule for completion of these activities and updates the FY06 Amended Site Management Plan. The use of a SMP allows for annual adjustment in scheduled activities for reasons such as Federal budgetary constraints, changes in scope of investigation/remediation activities or other unanticipated events. These changes are governed by the Federal Facility Agreement (FFA) for PNS. The FFA establishes the roles and responsibilities of the Navy and United States Environmental Protection Agency (USEPA) and serves as an Interagency Agreement (IAG) for the completion of all necessary investigation and remedial actions at PNS.

The following section summarizes the location, mission, operations history, and environmental activities history at PNS.

1.1 FACILITY LOCATION AND MISSION

Situated within the town limits of Kittery, Maine, PNS is located on an island in the Piscataqua River, referred to on National Oceanic and Atmospheric Administration (NOAA) nautical charts as Seavey Island, with the eastern tip given the name Jamaica Island. Attached by a rock causeway is Clark's Island, which is not industrialized. The Piscataqua River is a tidal estuary that forms the southern boundary between Maine and New Hampshire. PNS is located at the mouth of the Great Bay Estuary (commonly referred to as Portsmouth Harbor). The Great Bay Estuary and Site Location are shown on Figure 1-1. The Facility Site Map, showing conditions as of the signing of the FFA (September 1999), is included as Figure 1-2.

PNS is engaged in the conversion, overhaul, and repair of submarines for the Navy. PNS has a history dating back to 1800 when the facility was established. 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 from 1917 to the present. PNS continues to service submarines as its primary military focus.

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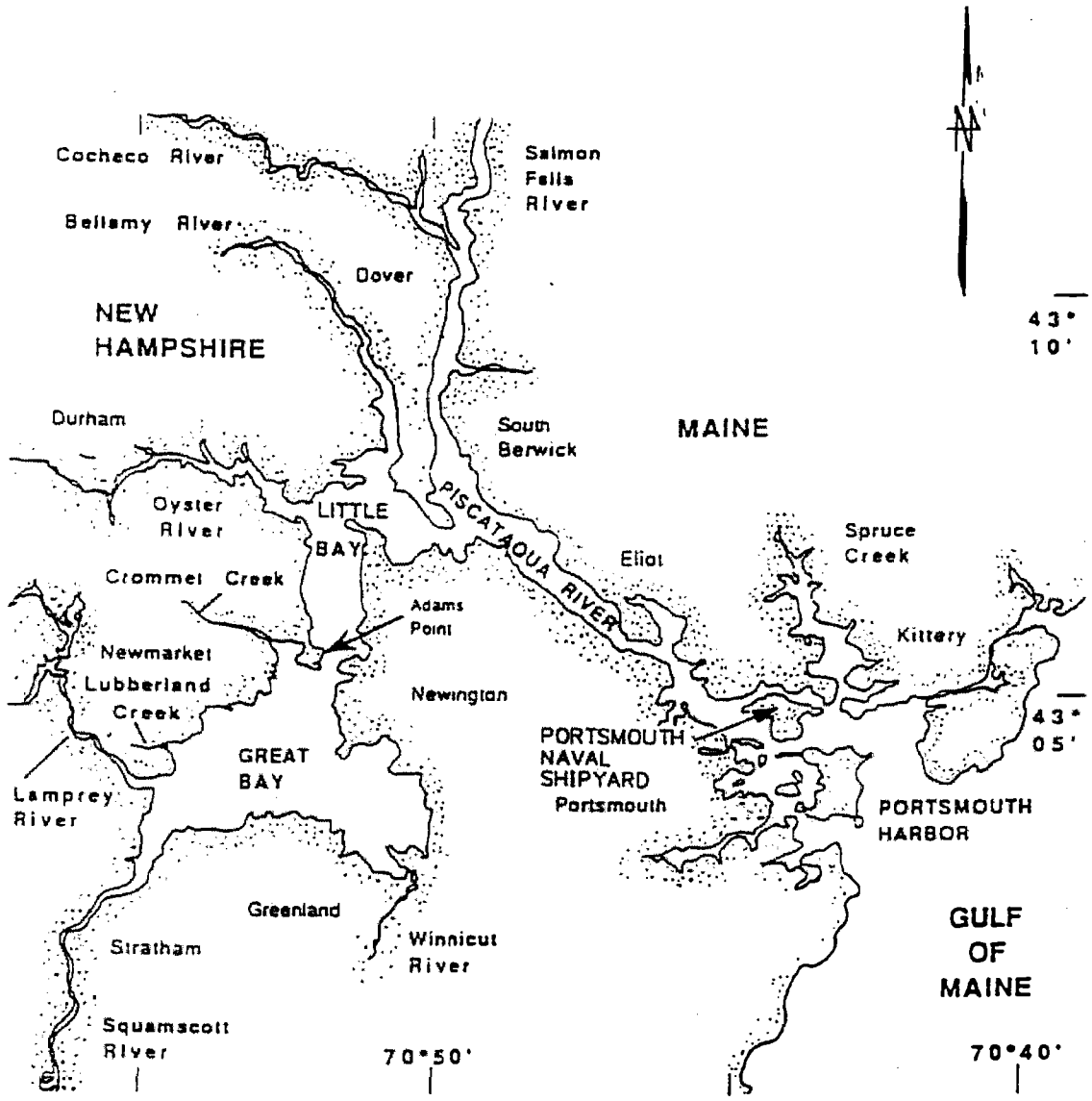

REFERENCE: THE ECOLOGY OF THE GREAT BAY ESTUARY, NEW HAMPSHIRE AND MAINE: AN ESTUARINE PROFILE AND BIBLIOGRAPHY, EDITED BY FREDERICK T. SHORT, UNIVERSITY OF NEW HAMPSHIRE JACKSON ESTUARINE LABORATORY, OCTOBER 1992

DRAWN BY HJP DATE 2/16/99	Tetra Tech NUS, Inc.	CONTRACT NO. 7090	OWNER NO. 0256
CHECKED BY DJC DATE 6/13/01	GREAT BAY ESTUARY AND SITE LOCATION PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE	APPROVED BY	DATE
COST/SCHED-AREA		APPROVED BY	DATE
SCALE NOT TO SCALE		DRAWING NO. FIGURE 1-1	REV. 0

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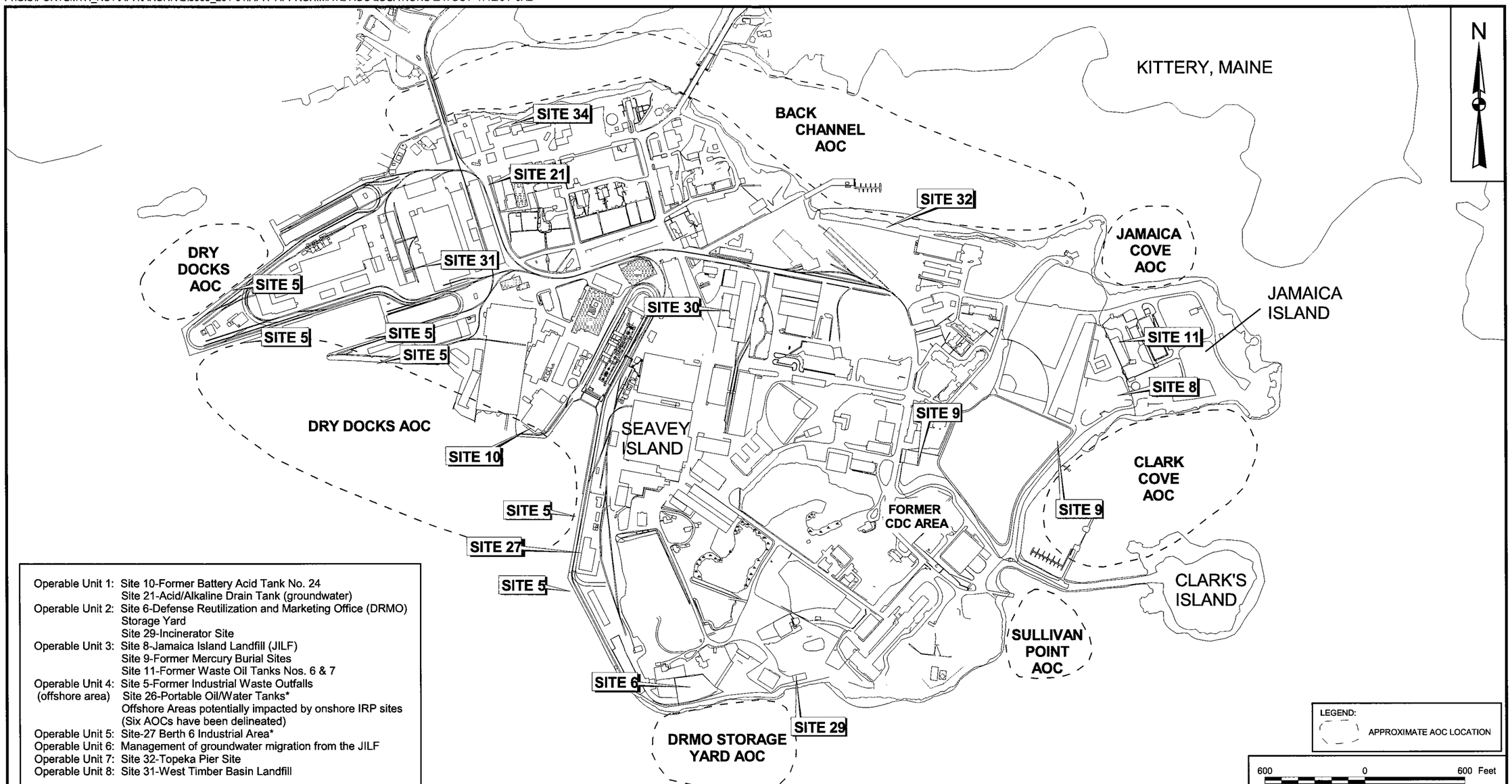
P:\GIS\PORTSMTH_NSY\APR\ARCHIVE\5003_201-01.APR APPROXIMATE AOC LOCATIONS LAYOUT 7/12/04 JAL



Operable Unit 1: Site 10-Former Battery Acid Tank No. 24
Site 21-Acid/Alkaline Drain Tank (groundwater)
Operable Unit 2: Site 6-Defense Reutilization and Marketing Office (DRMO) Storage Yard
Site 29-Incinerator Site
Operable Unit 3: Site 8-Jamaica Island Landfill (JILF)
Site 9-Former Mercury Burial Sites
Site 11-Former Waste Oil Tanks Nos. 6 & 7
Operable Unit 4: Site 5-Former Industrial Waste Outfalls
(offshore area) Site 26-Portable Oil/Water Tanks*
Offshore Areas potentially impacted by onshore IRP sites (Six AOCs have been delineated)
Operable Unit 5: Site-27 Berth 6 Industrial Area*
Operable Unit 6: Management of groundwater migration from the JILF
Operable Unit 7: Site 32-Topeka Pier Site
Operable Unit 8: Site 31-West Timber Basin Landfill

Site Screening Area: Site 30 - Galvanizing Plant Building 184
Site Screening Area: Site 34 - Former Oil Gasification Plant

* SITES 26 AND 27 HAVE BEEN RECOMMENDED FOR NO FURTHER ACTION UNDER CERCLA. ALSO SITE 26 IS NOT INDICATED BECAUSE THE TANKS ARE/WERE USED WHERE NECESSARY ALONG THE BERTHS AND DRY DOCKS OF PNS.

DRAWN BY D. PERRY	DATE 4/16/99	Tetra Tech NUS, Inc.	CONTRACT NUMBER 2833	OWNER NUMBER CTO 815
CHECKED BY D. COHEN	DATE 7/8/04	FACILITY SITE MAP CONDITIONS AS OF SEPTEMBER 1999 PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE	APPROVED BY —	DATE —
COST/SCHEDULE-AREA			APPROVED BY —	DATE —
SCALE AS NOTED			DRAWING NO. 1 - 2	REV 0

1.2 HISTORY OF HAZARDOUS WASTE DISPOSAL, ENVIRONMENTAL INVESTIGATION, AND REMEDIATION ACTIVITIES

The following is a description of the history of hazardous waste disposal, environmental investigation, and remediation activities performed prior to when the FFA was signed for PNS (in September 1999). A fact sheet discussing the current status of each site is provided in Appendix D.

Years of shipbuilding and submarine repair work at PNS have resulted in hazardous substances being released into the soils, groundwater, surface water, and sediment on and around Seavey Island. As a result, investigation and remediation activities have been performed under the IR Program.

The purpose of the IR Program is to identify, investigate, assess, characterize, and clean up or control releases of hazardous substances; and to reduce the risk to human health and the environment from past waste disposal operations and hazardous material spills at Navy/Marine Corps activities. Investigations of hazardous substance releases at PNS began in 1983 when the Navy completed an Initial Assessment Study (IAS) (Weston, 1983) that identified and assessed sites posing a potential threat to human health and the environment. The final phase of this study was completed in 1986 with the issuance of a Final Confirmation Study (FCS), (LEA, 1986), which evaluated the sites identified in the IAS to confirm the presence of contamination.

The USEPA became involved with PNS in 1985 when the agency requested information on PNS' hazardous wastes and conducted a visual site inspection under the authority of the Resource Conservation and Recovery Act (RCRA). Since 1988, the Maine Department of Environmental Protection (MEDEP) has also provided oversight of investigation and remediation of PNS. RCRA provides "cradle to grave" tracking of hazardous substances, from generator to transporter for treatment, storage, or disposal. RCRA activities are conducted in four phases: the RCRA Facility Assessment (RFA); the RCRA Facility Investigation (RFI); the Corrective Measures Study (CMS); and the Corrective Measures Implementation (CMI) Plan. Until the mid-1990s, investigations at the PNS were conducted under RCRA authority. Effective May 31, 1994, PNS was included on the National Priority List (NPL). Subsequently, the studies have been conducted under the authority of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), commonly known as Superfund.

In 1993, the PNS sites were evaluated by USEPA under Superfund's Hazard Ranking System (HRS), used to determine the relative threats posed to the public health and environment by sites contaminated with hazardous substances (TRC Companies, 1993). Under the HRS, a score is developed based on the potential for hazardous substances to spread from the site through air, surface water, and groundwater. Additional ranking factors include population, waste characterization, and potential damage to natural resources. Based on the HRS evaluation, PNS was proposed for inclusion on the USEPA's NPL in June

1993 and added to the NPL in May 1994. Since then, USEPA has coordinated the transition from RCRA to the CERCLA/Superfund process to ensure the uninterrupted and continued progress in the investigations. Ongoing work still meets the intent of the Hazard and Solid Waste Amendments (of 1984) (HSWA) Permit, but the ongoing onshore study to develop and evaluate remedial activities is entitled as a Feasibility Study (CERCLA terminology) and combines both RCRA and CERCLA criteria. Consistent with the transition from RCRA to CERCLA, the Solid Waste Management Unit (SWMU) terminology has since been replaced with "site". Refer to Section 3.0 of this report for a description of the RCRA and CERCLA processes. The USEPA, the MEDEP, and the Navy continue to work toward site cleanup under CERCLA. The FFA for PNS was signed between the USEPA and the Navy in September 1999. Among other things, the FFA outlines the roles and responsibilities for the USEPA and the Navy, establishes deadlines/schedules, and establishes a mechanism for resolution of disputes. The FFA also provides for participation of the State in the process even though they have chosen not to be a party to the FFA.

The RFA (Kearney & Baker/TSA, 1986) identified 28 potential SWMUs located onshore and offshore of PNS. These are waste management sites that were known to exist or sites where known or potential releases of hazardous wastes or hazardous constituents occurred. After the 28 potential SWMUs were examined in greater depth, 15 were eliminated from further investigation, leaving 13 SWMUs. As a result of the RFA findings, in March 1989, the USEPA issued a Corrective Action Permit under the RCRA Hazardous and Solid Waste Amendments of 1984 (HSWA Permit) (USEPA, 1989) that required the PNS to investigate the 13 SWMUs (sites) and take appropriate corrective action. In 1994, the USEPA directed that the onshore and offshore components of work required by the HSWA permit be separated, because the onshore portion of the study was being delayed by the more complex offshore investigation.

1.2.1 Onshore Studies

In accordance with the HSWA Permit requirements, the RFI was performed. The RFI consisted of several phases of investigations spanning from October 1989 to February 1992. The results of the RFI were then assembled into the RFI Report (McLaren/Hart, 1992b). The RFI "Approval with Conditions" was issued by the USEPA in March of 1993. The Addendum to the RFI report (McLaren/Hart, 1993b) partially responded to the USEPA "Approval with Conditions" however, many requirements of the "Approval with Conditions" called for additional field work to resolve data gaps. Subsequently, the RFI Data Gap field work was conducted during June/July of 1994. Results are presented in the RFI Data Gap Report (Halliburton NUS, 1995c) and are considered supplemental to the RFI report.

Analytical data collected during the RFI for surface and subsurface soils, groundwater, surface water and ambient air were evaluated in accordance with the USEPA Superfund Risk Assessment Guidance. The results of this evaluation were summarized in a draft document titled Public Health and Environmental Risk Evaluation: Part A Human Health Risk Assessment (PHERE), (McLaren/Hart, 1994a). These results were

utilized in developing the Final Media Protection Standards (MPSs) Proposal (McLaren/Hart, 1994b). Final MPSs were then set by the USEPA. The final MPSs were essentially used as Preliminary Remediation Goals (PRGs) in the Draft Onshore Feasibility Study (FS) Report (Halliburton NUS, 1995a). The Draft Onshore FS Report identifies and recommends remedial alternatives for each SWMU. The Applicable or Relevant and Appropriate Requirements (ARARs) Report (Halliburton NUS, 1994b) and Revised CMS Proposal (Halliburton NUS, 1994a) also were utilized in developing the Onshore FS. ARARs are legally applicable or relevant and appropriate requirements, standards, criteria or limitations as used by CERCLA and as defined in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

The Ambient Air Quality Monitoring Report (McLaren/Hart, 1992a) was developed to support identification of SWMUs where contamination may have resulted in adverse impacts to air. Because of questions on previous sampling methods, techniques, and reporting methods, the Phase II Ambient Air Quality and Meteorological Monitoring Report (B&R Environmental, 1996a) was prepared as a confirmation air monitoring study.

The Groundwater Investigation and Monitoring Plan (B&R Environmental, 1996b) was developed to address facility groundwater. The purpose of this plan is to facilitate the implementation of a cost-effective, groundwater investigation and interim monitoring plan for sites of concern at PNS. The data was evaluated to determine the impact on the quality of groundwater in the aquifer and the impact on state waters.

The Site Screening Work Plan for Building 184 (Site 30), West Timber Basin (Site 31), and Topeka Pier (Site 32) (B&R Environmental, 1998b) was developed to outline work necessary to determine whether these sites should become Areas of Concern (AOCs) that require further study through the CERCLA Remedial Investigation (RI)/FS process.

The Work Plan for Teepee Incinerator (Site 29) and Building 238 (Site 10) (B&R Environmental, 1998a) was to provide additional information to further characterize the sites to make remedial decisions. The purpose of this plan for Site 10 was to investigate additional areas based on new information that indicates the pipes under Building 238 may have leaked, in addition to the underground storage tank (UST), which was removed in 1986. The purpose of this plan for Site 29 was to more fully characterize the area (formerly included as part of Site 6); including investigation for dioxins in the location where open burning occurred, and where the teepee incinerator was located.

1.2.2 Offshore Studies

The offshore portion of the RFI included an Estuarine Ecological Risk Assessment (EERA) and a Human Health Risk Assessment (HHRA) (McLaren/Hart, 1994c). The Ecological and Human Health Risk

Assessments were both based on offshore sampling and analysis of surface water, sediments and biota conducted as part of the EERA. Seeps from PNS were also sampled and analyzed.

The overall purpose of the EERA was to assess the potential adverse environmental effects from past discharges of contaminants from PNS. Two functional phases of the EERA were developed to fulfill this objective. The Phase I EERA (Johnston et. al, 1994), initiated in September 1991 and completed in May 1993, assessed the environmental quality in the Great Bay Estuary focusing on the lower Piscataqua River area in relation to the PNS. Phase I included the collection and analysis of water (water column and seep), sediment (surface sediments and sediment cores), and biota (mussels, lobster, winter flounder, oysters, eelgrass and algae) samples. The objective of the Phase II EERA, the analysis phase initiated in July 1992 and completed in the summer of 1995, was to test hypotheses from Phase I and quantify the ecological risk from the PNS. Phase II included the collection and analysis of additional water (water column and seeps), sediment (surface sediments and sediment cores) and biota (mussels, lobster, flounder and eelgrass) samples. Phase I and Phase II data and conclusions were synthesized to develop the final EERA. The EERA (NCCOSC, 2000) has been finalized.

The data collected during Phase I of the Ecological Risk Assessment work was also used to develop the Human Health Risk Assessment for Offshore Media (McLaren/Hart, 1994c). The data collected from Phase II was evaluated to assess human risk in the Phase I/Phase II Data Comparative Analysis Report (TtNUS, 1998). The Offshore Human Health Risk Assessment Report is final, and the results have been used to establish human health surface water and sediment MPSs. The Offshore Human Health MPS Report is currently in the draft stage (Halliburton NUS, 1995b).

Although they will not be finalized, both the Offshore Ecological and Human Health MPSs will be utilized in developing PRGs for surface water and sediment, which take into consideration protection of both ecological receptors and human health. Surface water and sediment PRGs will be used for the development and evaluation of offshore remedial objectives and alternatives in the Offshore FS, as appropriate.

The draft human health and draft ecological MPSs and the results of the groundwater monitoring have been used in the contaminant fate and transport modeling effort to evaluate the effects of groundwater contaminant migration on the offshore environment. This link between the onshore and offshore has been evaluated through the onshore/offshore contaminant fate and transport model.

An Interim Offshore Monitoring Plan (TtNUS, 1999) has been prepared as required by the Interim Record of Decision (ROD) for Operable Unit 4 (Navy, 1999). The monitoring program is designed to provide offshore monitoring in the interim period before completion of the Offshore FS and selection and implementation of the final remedy for the offshore.

1.2.3 Operable Units

In the 1990s, the Navy reorganized the approach used to study the IRP sites. Instead of addressing the PNS sites as one large study and cleanup action, the sites were organized into five operable units (OUs) that clustered them with other sites with similar kinds of contamination or combined them because of geographic proximity. Restructuring into operable units allows sites that are ready for cleanup to proceed without waiting for studies on other sites to be completed. As of the signing of the FFA, there were five OUs (OU1 through OU5). Since then, four additional OUs (OU6 through OU9) were identified. Subsequently, two of the nine OUs have been deleted; OU5 was removed from the CERCLA program and OU6 was recombined with OU3. Section 2.1 discusses the OUs at PNS.

1.3 REPORT ORGANIZATION

The SMP is organized as follows:

- Section 1.0 is this introduction.
- Section 2.0 describes the history and status of each site at PNS prior to signing the FFA (September 1999).
- Section 3.0 provides a description of the CERCLA remedial process and the RCRA Corrective Action Process and describes the similarities and differences between RCRA and CERCLA.
- Section 4.0 provides a description of the ranking procedure and a summary of ranking results.
- Section 5.0 presents the sequence of activities and target dates for primary/secondary documents along with a discussion of their development.
- Section 6.0 provides a list of documents prepared as part of the IR Program for PNS prior to and after signing the FFS (September 1999).
- Section 7.0 provides a list of references.

The Appendices are as follows:

- Appendix A presents the Defense Environmental Cleanup Program Fact Sheets related to the Relative Risk Site Evaluation (provided in Appendix E of the Relative Risk Site Evaluation Primer).
- Appendix B presents the PNS Relative Risk Site Evaluation Ranking Worksheets.
- Appendix C presents the current Schedules.
- Appendix D provides the Site Update Fact Sheet, which provides the current status of the IR program sites at PNS.

The SMP will be annually updated as specified in Section 12.0 of the FFA.

2.0 SITE DESCRIPTIONS

This section presents the history and status of each site identified as needing further investigation at PNS prior to the signing of the FFA (September 1999). This section also discusses the grouping of sites into OUs, including the OUs identified after the signing of the FFA. A fact sheet discussing the current status of each site is provided in Appendix D.

To date, 13 sites and two site-impacted areas have been investigated at PNS, which were identified in the HSWA permit. Four other sites (Sites 30, 31, and 32, as well as Site 34, the Former Oil Gasification Plant) have been identified and investigated recently, which were not identified in the HSWA permit. These sites, as well as several areas offshore of PNS, have been identified as AOCs. AOCs are locations of potential or suspected contamination, or areas of known contamination that require further study through the CERCLA RI/FS process. To most efficiently address the AOCs, AOCs have been combined where appropriate into OUs. A description of the OUs is provided herein.

Several sites not identified in the HSWA permit have also been included in the IR Program. Site Screening Areas (SSAs) include Galvanizing Plant Building 184 (Site 30), the West Timber Basin (Site 31), Topeka Pier Site (Site 32) and the Former Oil Gasification Plant (Site 34). SSAs are areas that require preliminary screening to determine whether they should become AOCs that require further study through the CERCLA RI/FS process.

Figure 1-2 presents the location of the AOCs and SSAs defined.

2.1 OPERABLE UNIT DESCRIPTIONS

The remedial process outlined in the HSWA Permit provided specific scopes and schedules for the RFI and CMS for all sites at PNS. As the process has progressed, it has become clear that certain sites and the offshore areas will require more time than others to be adequately characterized in accordance with the HSWA Permit and CERCLA. To expedite the process for those sites that have been adequately characterized and to group sites with similar characteristics, five OUs were designated. This development is consistent with CERCLA. The separation of PNS into OUs permits the remedial process to progress at a faster pace, rather than waiting for complex issues to be resolved for more complex sites.

Since the signing of the FFA, OU6 was identified in 2000 to address management of migration from the Jamaica Island Landfill (JILF). However, an Explanation of Significant Difference (ESD) for the OU3 ROD was signed in October 2005 to document that management of migration of groundwater from the JILF will be addressed under the OU3 remedy. Therefore, OU6 was recombined with OU3. Based on the results

of the site screening investigation, Sites 31, 32, and 34 have been designated as OU8, OU7, and OU9, respectively. In addition, with the signing of the Decision Document for No Further Action for Site 27, there are no longer any sites within OU5 and therefore, this OU has been removed from the CERCLA program. These updates as well as updates on the other sites at PNS are provided in Appendix D.

The following list includes all the OUs that have been identified at PNS to date.

OU1

- Site 10 – Former Battery Acid Tank No. 24
- Site 21 – Former Acid/Alkaline Drain Tank (groundwater only)

OU2

- Site 6 – Defense Reutilization and Marketing Office Storage Yard (DRMO) including DRMO Impact Area, Quarters S, N, & 68
- Site 29 – Former Teepee Incinerator Site

OU3

- Site 8 - Jamaica Island Landfill (JILF) Source Control including JILF Impact Area, Former Child Development Center (CDC) (including JILF management of migration, formerly OU6)
- Site 9 – Former Mercury Burial Sites (MBI and MBII)
- Site 11 - Former Waste Oil Tanks Nos. 6 & 7

OU4

- Site 5 – Former Industrial Waste Outfalls
- Site 26 - Portable Oil/Water Tanks
- Offshore Areas Potentially Impacted by PNS On-Shore Sites

OU5

- Site 27 - Berth 6 Industrial Area (formerly Fuel Oil Spill Area at Berth 6)

OU7

- Site 32 – Topeka Pier Site

OU8

- Site 31 – West Timber Basin

OU9

- Site 34 – Former Oil Gasification Plant, Building 62

2.2 SITE DESCRIPTIONS

Site descriptions reflect the status prior to signing of the FFA. See Appendix D for the current status of each site.

2.2.1 Site 10 – Former Battery Acid Tank No. 24

This unit, used from 1974 to 1984, was an underground, 9680-gallon steel holding tank for waste lead battery acid from battery rebuilding operations. The unit was located outside of Building 238, within the Controlled Industrial Area (CIA). During an investigation of tank volume fluctuations in 1984, an approximate 2-inch hole was discovered at the bottom of the tank. The water level in the tank would rise and fall with the apparent tide. The period of potential release is not known. The tank was taken out of service in 1984 and removed in 1986. Soils were sampled at the time of tank removal. The area is currently covered by asphalt. Confirmation soil samples were taken from soil borings installed during the RFI investigation. IAS interview sheets found after the initial RFI and removal action were completed, indicated potential historical fill line leakage, necessitating expansion of the area of investigation. Additional investigation was performed in the summer of 1998, including surface soil sampling (at the Building 238 basement/crawl space area) and monitoring well installation.

2.2.2 Site 21 – Former Acid/Alkaline Drain Tank

This unit, used from 1974 to 1991, was a 695-gallon underground steel tank. The tank was located outside the Sheet Metal Shop, Building 75, in an industrial area just north of the CIA. The tank was located beneath the middle of a road and adjacent to railroad tracks. The tank held discharge from two clothes washing machines used to clean air filters. The prefilters were used to remove dirt, dust and

debris from ships. Detergent used for cleaning was "Lestoil". Other wastes included rinse water from three deburring machines. Minor volumes of overflow wastes consisted of unspecified waste acid and alkaline metal surface-cleaning solutions, and solid residues. During the RFI the tank was excavated and removed by PNS in November 1991. Each end of the tank was found to have a hole approximately one by two feet. Stained fill and exposed bedrock was evident. Six inches of acid/alkaline/water solution and sludge were visible within the tank. During tank removal, some of the acid/alkaline/water (less than 10 gallons) solution spilled from the holes at the tank ends onto the fill material. Groundwater was not encountered during excavation. The excavation was backfilled with clean fill material and a mixture of fresh hot tar and excavated soil, and capped with four inches of hot asphalt. No further action for Site 21 soil was agreed upon among the Navy, the USEPA, and the MEDEP and formalized in a Consensus Document (Navy, 1996). Additional groundwater investigation was conducted at Site 21 in conjunction with the investigation of the West Timber Basin (Site 31).

2.2.3 Site 6 - Defense Reutilization and Marketing Office Storage Yard (DRMO)

The DRMO, which has been in operation for more than 30 years, is approximately two acres and it serves as a temporary storage area for used materials prior to off-site recycling or disposal. Materials stored at the DRMO include lead and nickel-cadmium battery elements, motors, typewriters, paper products, and scrap metal. Most of the DRMO is situated on filled land. Until recently, there were no release controls at the DRMO. Previous visual inspection indicated ponding of precipitation in some areas and direct runoff to the Piscataqua River in other areas. Practices that resulted in obvious sources of contaminants, such as open storage of batteries, which could be leached or otherwise released by pathways such as infiltration or runoff, were terminated approximately in 1983. Currently within the fenced area of the DRMO, asphalt or an interim cap covers most of the surface.

The FCS was conducted at the DRMO in 1984. Surface and subsurface soil samples were collected within the DRMO and immediately west of the DRMO. Heavy metal contamination was noted; however, additional information was necessary to determine the nature and extent of contamination and to define the subsurface geology at the DRMO.

During 1989 to 1992, as part of the RFI, surface and subsurface soils, and groundwater samples were collected at the DRMO and in the vicinity. During the RFI Data Gap investigation of 1994, hydrogeology and tidal influences were further investigated.

In 1993, interim corrective measures were conducted at the DRMO which included capping and paving of sections of the DRMO, installation of storm water controls, and installation of a new concrete curb. The cap consists of 12 inches of compacted, crushed stone aggregate stabilized with portland cement, two

layers of 16-ounce non-woven needle-punched geotextile, and a geocomposite clay liner (GCL). An area on the northwest side of the DRMO was paved with two inches of asphalt (McLaren/Hart, 1993a).

During the RFI, surface soil sampling was conducted north of the DRMO in the vicinity of Quarters S, N, and 68 to assess the potential for possible wind dispersal of contaminants from the DRMO. Also, the Site 29 Teepee Incinerator Site, which is located east of the DRMO Impact Area, is described in the following section.

In 1999, a removal action was performed at DRMO after erosion was identified along the shoreline. The slope was regraded and layers of stone and geotextile were placed to stabilize the slope (FWENC, 2001a).

2.2.4 Site 29 – Former Teepee Incinerator Site

Aerial photographs and historical records reveal that the land beneath and around the Industrial Waste Treatment Plant was originally used for open pit and incinerator burning. The area was also reportedly used for occasional disposal of waste paints. The ash and residue was removed after burning and placed in landfills. The fill was being deposited in the JILF (Site 8) by the 1950s. Site 29 previous limited investigation occurred in conjunction with Site 6. The 1986 RFA and HSWA permit did not identify Site 29 as a separate site. Additional investigation was performed in the summer of 1998, including dioxin sampling.

2.2.5 Site 8 - Jamaica Island Landfill (JILF)

The JILF covers an approximate area of 25 acres of filled land. Prior to landfilling activities, tidal flats separated Jamaica Island from Seavey Island. It has been reported that drainage channels existed within these tidal flats. From approximately 1945 to 1978 this area was filled with general refuse, trash, construction rubble, and various industrial wastes. The various industrial wastes received reportedly included incinerator ash; plating sludges containing chromium, lead and cadmium; asbestos insulation; volatile organic compounds including trichloroethene (TCE), methylene chloride, toluene and methyl ethyl ketone (MEK); acetylene and chlorine gas cylinders; contaminated dredge spoils containing chromium, lead, small amounts of oils containing polychlorinated biphenyls (PCBs), mercury and possibly phenols; waste paints and solvents; and spent sandblasting grit. Other items reported to have been used as fill at the JILF include reinforcing bars, chain-link fencing, and a small two-man submarine. The JILF is covered with topsoil, pavement and gravel and is used for recreational activities, vehicle parking, and equipment storage. The recreational activities include a fitness area and a jogging track. Other uses of the landfill and adjacent area include equipment storage and hazardous waste storage facility.

In 1978, the PNS received approval to dredge over 100,000 cubic yards of sediment from Berths 6, 11 and 13, and to dispose of the material in a portion of the JILF. Cyanide, heavy metals, oil and grease, and low concentrations of PCBs were reported in dredge spoils samples. Approximately nine acres of the landfill were covered with dredge spoils from 1978 (Normandeau Associates, 1978).

At the time of disposal of the dredge spoils in 1978, a new dike was designed to contain the dredge spoils and to prevent post-construction seepage or runoff from the contaminated spoil into the adjacent Piscataqua River. A rock dike was placed by the area receiving the deepest spoils. The rest of the disposal site was enclosed with a granular fill dike. The dikes were to extend along the majority of the containment area. A 2-foot thick soil cover was placed on top of dredge spoils to minimize precipitation from penetrating the dredge spoils. A layer of topsoil was placed on top of the entire contained area and seeded to create an erosion resistant turf (Normandeau Associates, 1978).

During 1989 to 1992, as part of the RFI, surface and subsurface soils and groundwater samples were collected at the JILF. During the RFI Data Gap investigation of 1994, hydrogeology and tidal influences were further investigated. An advanced geophysical survey was conducted in 1998 at the JILF. The specific technology is called Multi-sensor Towed Array Detection System (MTADS), which is a magnetometer and pulsed induction electromagnetic system developed by the Navy Research Laboratory (NRL). Twenty-five test pits were dug in the JILF in areas outside of the running track area. A report on the findings of these test pits including sample results is under development.

At the time the RFI was conducted, the Child Development Center (CDC) was located to the west of the JILF. Sampling was conducted at the CDC to ensure that the children at the CDC were not being exposed to soil contaminated by wind dispersal of contamination from the JILF. Surface soil samples were collected within and around the fenced area at the CDC to evaluate the potential for surface soil contamination. The CDC has since been moved to a different location, and this area is now called the Former CDC. The building and playground equipment have been removed and the area is not currently used by children. The Navy has determined additional investigation is needed at the Former CDC prior to determining a final remedial action. This impact area will be addressed separately from the remainder of OU3.

2.2.6 Site 9 – Former Mercury Burial Site I and Mercury Burial Site II (MBI and MBII)

Poured concrete blocks and precast concrete pipes containing mercury contaminated wastes were reportedly buried between 1973 and 1975 at two locations within the boundaries of JILF. The two mercury burial sites are referenced as Mercury Burial Site I (MBI) and Mercury Burial Site II (MBII) and were reported to be placed under 8 to 10 feet of fill. Mercury contaminated wastes are reported to include fluorescent bulbs, thermometers, mercury switches and rags, brooms, and dust pans.

During the RFI, attempts were made to locate both burial sites. The original excavation locations were based on existing concrete plaques that marked the presumed location of the burial sites. Only burial site MBI was located in the field during the original RFI investigation. The poured concrete blocks and precast concrete pipes at MBI were excavated and inspected for integrity in 1991 during the RFI. All of the concrete appeared to be in reasonably good condition. Concrete blocks and the vertical section of concrete pipe were encountered at approximately 7.5 feet. Each poured concrete block was supported by a 1-foot thick concrete pad; the concrete sewer pipe was not supported. All the concrete appeared intact and was left in place and backfilled with original soil and fill material.

The reported location of MBII is in the western corner of the JILF, just south of the H25 Building parking lot. Information gathered by PNS personnel prior to the RFI Data Gap field investigation indicated that MBII may have been located south of the previous excavation or southeast of Building H25 just beyond or partially under its fenced in and paved parking lot (this was investigated as part of the RFI Data Gap Investigation). Additional excavations were conducted; however, poured concrete blocks and precast concrete pipes were not located during these excavation activities.

During 1989 to 1992, as part of the RFI, subsurface soils and groundwater samples were collected at the Mercury Burial sites. During the RFI Data Gap Investigation of 1994 the concrete pipe at MBI was excavated and disposed in an offsite landfill. The pipe was found to be plugged with concrete at both ends. Sampling results did not indicate an elevated concentration of mercury. Also during the RFI Data Gap investigation, another attempt, via test pit excavation, was made to locate MBII, with no success. The three remaining concrete blocks at MBI, and their contents were removed and properly disposed of, as a Removal Action in 1997 (FWENC, June 2001b). MBII was located in the Summer 2000. A total of eight blocks and their contents were removed and disposed of as a CERCLA Removal Action and disposed in accordance with Federal and state law (FWENC, 2001c).

2.2.7 Site 11 - Former Waste Oil Tanks Nos. 6 and 7

Former Waste Oil Tanks Nos. 6 and 7 have been referred to as Waste Oil Tank Number 12 in the past. These were two 8,000-gallon underground steel tanks from railroad cars, in use from 1943 to 1989, and located at the northeastern end of the JILF. Waste oils from facility shops including cooling and cutting oils, motor oils, transmission oils, and hydraulic oils were stored in the tanks prior to off-site disposal. A Consent and Agreement Order has indicated that degreaser solvents were labeled as waste oils and may have been inadvertently stored in these tanks. Waste oils may also have contained various metals. In 1979 the tanks were excavated, inspected, and reburied because there was no evidence of releases at that time. In 1986, both tanks were tightness tested and found to be sound. These tanks were excavated and removed in 1989 according to state regulations and inspections. Upon removal, both tanks appeared

sound and neither tank showed signs of leakage or deterioration. Soil contamination is believed to have occurred from spillage during filling.

Following tank removal, sampling was conducted by PNS and MEDEP. As a result of the elevated levels of lead and other contaminants, 332 tons of soil were excavated and disposed in an off-site RCRA permitted land disposal facility. Site 11 soils and groundwater were investigated in both the RFI and RFI Data Gap investigations.

In 1994 an investigation was conducted by C.T. Male Associates to determine the presence or absence of soil contamination in the area of the planned Hazardous Waste Transfer Facility. This investigation was part of the Military Construction (MILCON) project for the construction of the Transfer Facility. Information gathered is available for use by the IR Program. The report was submitted to the State of Maine in accordance with permit conditions. Eight test pits were excavated and subsurface soil samples were collected at every two-foot interval; one sample from each test pit was selected for analysis, except for TP-1 where two samples were collected. Also, one field duplicate was collected. To support selection of the samples for analysis, field headspace screening of soil samples was conducted.

2.2.8 Site 5 – Former Industrial Waste Outfalls

The former Industrial Waste Outfalls (Site 5) refer to several discharge points along the Piscataqua River at the western end of the site. The outfalls were used to discharge liquid industrial wastes prior to construction of the Industrial Waste Treatment Plant. The outfalls are believed to have been in operation from 1945 to 1975 and are located near Berths 6, 11 and 13. Wastes discharged include wastes from plating and battery shops contained in Buildings 79 and 238. The wastewaters may have contained heavy metals (mercury, lead, cadmium, chromium, copper and zinc), oil and grease, and PCBs.

2.2.9 Site 26 - Portable Oil/Water Tanks

Oil/water tanks at the submarine berths are used for the cleanout of submarine bilges and various tanks. Resulting oil wastes are pumped to railroad tank cars and properly disposed. Although the tanks continue to be used, operations have been modified and equipment improved to eliminate spillage and improve handling methods.

2.2.10 Offshore Areas

Offshore areas refer generally to areas in the Piscataqua River and Great Bay Estuary that may have been affected by the release of hazardous waste or hazardous constituents from any site or study area located at PNS. Offshore areas have been the subject of significant investigative activities to date. The

offshore studies are in the risk assessment/media protection standards development stage. An ecological risk assessment, in accordance with CERCLA procedures and recommendations, investigated the likelihood of adverse ecological effects as a result of hazardous waste releases from the Shipyard. These data (Phase I) were also used to prepare a human health risk assessment to assess human health exposures from offshore media. An interim Record of Decision (Navy, 1999) was prepared for offshore monitoring. The Interim Offshore Monitoring Plan (TtNUS, 1999) has been developed and offshore monitoring is being conducted in accordance with the plan.

2.2.11 Site 27 - Berth 6 Industrial Area (formerly Fuel Oil Spill Area)

In 1978, a ruptured underground pipeline near Berth 6 released No. 6 fuel oil (Bunker "C"). The pipeline was used from the early 1920s to 1978 to carry No. 6 fuel oil for fueling operations and it ran from Berth 6 to the pump house, Building 151, within the CIA. The pipeline ran parallel to and along Berth 6 and was buried approximately six feet below ground. A section of the pipeline was excavated and removed by a contractor. No additional information on the release is available. Reportedly, the broken pipeline and surrounding contaminated soil was excavated. The area is currently covered with asphalt.

There are various other underground distribution pipelines that run through Berth 6. In 1981, two lines, a No. 6 fuel oil line and a No. 2 fuel oil line, failed hydrostatic testing and were capped and abandoned in place. Reportedly, a portion of the abandoned lines were cut and removed during excavation near Building 151. At that time oil was still in the lines and partially filled the excavation. The condition of the other distribution pipelines is unknown.

The field investigation for the Fuel Oil Spill Area adjacent to Berth 6 was expanded by the Navy in the RFI to include the tank farm as a potential contributor of fuel oil contamination at Berth 6. The northernmost portion of the tank farm was located approximately 500 feet southeast of the fuel oil spill area. The Fuel Oil Spill Area was found to be unrelated to the Fuel Oil Tank Farm.

2.3 SITE SCREENING AREAS

Four sites have been identified by PNS as potentially contaminated that were not identified in the 1986 RFA and included in the HSWA permit. The SSAs are geographical areas that require preliminary screening to determine whether further study pursuant to the CERCLA RI/FS process will be required. SSAs may expand or contract in size as information becomes available indicating the extent of contamination and the geographical area needed to be studied. The evaluation process is referred to in the FFA as the Site Screening Process (SSP), and provides procedures for determination, investigation, and scheduling of SSAs. In addition to the following SSAs, the FFA provides for determination and investigation of future SSAs.

Since the signing of the FFA, three SSAs have been designated as OUs. The following discussion reflects the status of the SSAs prior to signing of the FFA. Appendix D provides an update on the status of the SSAs. Figure 1-2 shows the locations of the SSAs.

2.3.1 Site 30 - Galvanizing Plant, Building 184

Constructed in 1943 as a Galvanizing Plant, Building 184 was closed after World War II (WWII) and most equipment removed. Later the building was used by the Electrical Manufacturing Department for dye storage and test equipment. In the late 1950s the space was converted into an area for the cleaning of piping with the use of such chemicals as sulfuric acid. In the late 1960s the area was converted into the present day Welding School and Laboratory. The field investigation has been completed and a report issued. Additional investigation consisting of exploration under the floor of the building is planned for this site.

2.3.2 Site 31 - West Timber Basin

This area was used for over 100 years for the storage and preservation of timber. As wooden shipbuilding and repair declined this area was no longer needed for this purpose. Another existing timber basin (at Site 32 - Topeka Pier site) constructed after the turn of the century, was sufficient to handle PNS requirements. The West Timber Basin was filled in prior to WWII. PNS plans indicate that the area was used for the disposal of general refuse. The field investigation has been completed and a report issued. Additional investigations will be conducted at this site; the schedule has yet to be determined for this work.

2.3.3 Site 32 - Topeka Pier Site

The area in the vicinity of Building 237, 154, 306, 129, 158 and H-23 was previously used as a salvage yard and portions are landfilled areas, including an east timber basin. The field investigation has been completed and a report issued. Additional investigation is planned for portions of the site; the schedule has not yet been developed.

2.3.4 Site 34 – Former Oil Gasification Plant, Building 62

Constructed in the early 1870s, Building 62 served as the Shipyard Illuminating Gas Manufacturing Plant, for about 30 years. At the turn of the century, gas illumination on the Shipyard was replaced by electricity. Approximately 8,000 gallons of paraffin or gas oil was used per year as the source for illuminating gas. Early gas oil illumination advertisements indicate one gallon of oil would produce approximately 100 gallons of gas. Also, little waste product was produced compared to the more prevalent coal gasification process.

The building was subsequently used by Public Works for a variety of purposes, including a blacksmith shop. In 1999 a removal action was undertaken at this site. A schedule for additional work to be performed has not been established at this time.

Six drums of ash were removed in 1999 as a CERCLA Removal Action and disposed in accordance with Federal and state law.

3.0 REGULATORY PROCESS ACTIVITIES

Beginning in 1980, investigations of PNS hazardous waste sites were conducted under the Department of Navy Assessment and Control of Installation Pollutants (NACIP) Program. Since 1986, investigations at PNS have been conducted under the Department of Defense (DOD) IR Program. Funding to pay for such investigations are allocated for DOD sites.

This SMP is an attachment to the FFA. The FFA was developed to enable the Navy to meet the provisions of CERCLA, RCRA, and applicable state law. Among other things, an FFA outlines roles and responsibilities, establishes deadlines/schedules, and outlines work to be performed.

The IR Program parallels CERCLA, otherwise known as Superfund. Under the Superfund program, past disposal activities which may have resulted in the release of hazardous constituents to the environment would undergo several phases of environmental investigation that would ultimately determine the need for a remedy, and if necessary, the selection and implementation of the remedy for the site. The phases of investigation under CERCLA include the Preliminary Assessment/Site Inspection (PA/SI), RI, FS, ROD, and Remedial Design/Remedial Action (RD/RA). The process required by the FFA is analogous to CERCLA with one exception: the PA/SI is replaced by the SSP. Superfund also has provisions for Interim Measures (IM) that can be implemented if a site poses an immediate threat to the environment.

The RCRA established a national strategy for the management of ongoing solid and hazardous waste operations at active sites. PNS engages in the generation, treatment, storage and disposal of hazardous wastes, which requires the facility to be permitted under the jurisdiction of RCRA. The HSWA of RCRA were enacted in 1984 and broadened the authority of RCRA to include a multi-step corrective action process for releases of hazardous wastes to the environment.

The RFA is the first step of the RCRA corrective action process and is similar to a CERCLA PA/SI. The RCRA corrective action process closely resembles the CERCLA program (see Table 3-1), and consists of the RFA (release identification step), the RFI (release extent characterization), the CMS (selection of corrective measure), and CMI (implementation of corrective measures). The RCRA corrective action program also includes an IM step that may be conducted in cases when short-term actions are needed to respond to immediate threats.

TABLE 3-1

RCRA AND CERCLA CORRECTIVE ACTION PROCESSES
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

RCRA	Vs. CERCLA	
RCRA Facility Assessment RFA	Preliminary Assessment/ Site Investigation PA/SI	• Identify releases needing further investigation
⇓	⇓	
RCRA Facility Investigation RFI	Remedial Investigation RI	• Characterize nature, extent, and rate of contaminant releases
⇓	⇓	
Corrective Measures Study CMS	Feasibility Study FS	• Evaluate/select remedy
⇓	⇓	
Corrective Measures Implementation CMI	Remedial Design Remedial Action RD/RA	• Design and implementation of chosen remedy

*Interim measures may be performed at any point in the corrective action process.

Most environmental activities at PNS were initiated under RCRA in accordance with the HSWA permit. However, PNS was included on the NPL effective May 31, 1994 and is now governed by CERCLA as described in the FFA.

This section describes the CERCLA remedial process, the RCRA Corrective Action Process and describes the similarities and differences between RCRA and CERCLA.

3.1 CERCLA PROCESS ACTIVITIES

This section provides a description of the CERCLA remedial process.

3.1.1 Preliminary Assessment/Site Investigation (PA/SI) and Site Screening Process (SSP)

The initial study conducted under CERCLA at a site in response to a real or suspected hazardous substance release is the PA/SI. At Federal Facilities, the lead agency (the Navy in the case of PNS) collects the data for the PA/SI. The USEPA evaluates the PA/SI data. The PA/SI relies heavily on existing information, and is limited in scope. If the PA/SI identifies sites or study areas as potentially posing a threat to human health or the environment, an RI/FS is conducted.

The SSP as outlined in the FFA is an alternative to the PA/SI process. The SSP is the mechanism for evaluating whether identified SSAs should proceed with an RI/FS. SSAs refer to areas not previously identified that may pose a threat, or potential threat, to public health, welfare or the environment.

The SSP considers current CERCLA and RCRA guidance to determine if there have been releases of hazardous substances, pollutants, or contaminants, to the environment from the SSA. The SSP Report provides the basis as to whether a site should become an AOC subject to further study through CERCLA RI/FS process.

A generic Site Screening Workplan has been developed to facilitate studies during this phase.

3.1.2 Remedial Investigation/Feasibility Study (RI/FS)

The RI/FS is the next phase of the CERCLA remedial process and is required for all AOCs. The RI is intended to determine the nature and extent of contamination, potential migration pathways, toxicity and persistence of contaminants and potential (risk) for adverse impacts to human health or the environment. The FS is intended to develop remedial objectives, identify ARARs, develop and screen remedial alternatives, analyze remedial alternatives, and compare the alternatives against the CERCLA criteria (protection of human health and the environment, compliance with ARARS, reduction of toxicity, mobility,

or volume through treatment, short-term effectiveness, long-term effectiveness, implementability, cost, state acceptance, community acceptance).

After completion of the RI/FS, a Proposed Plan (PP, also referred to as a Proposed Remedial Action Plan or PRAP) is completed which outlines the Navy's proposed remedial alternative. The PP is released to the public and a formal public comment period is held. Subsequently, a ROD that identifies the preferred remedial alternative(s) is issued. The State of Maine has the opportunity to concur on the ROD.

3.1.3 Removal Action

A removal action may be completed prior to or during the RI/FS to reduce the threat to human health or the environment by removing released hazardous substances or reducing potential exposure pathways. Emergency removal actions are taken when there is an imminent threat to human health or the environment. Time-critical removal actions are taken when a threat to public health or welfare of the environment exists and it is determined that less than six months exist before on-site removal activity must be initiated. Non-time-critical removal actions are those actions where a planning period of at least six months exists before on-site activities to reduce the threat to human health or the environment exists.

In order to select the best remedial alternative for non-time-critical removal actions an Engineering Evaluation/Cost Analysis (EE/CA) is prepared. Unlike the FS, the EE/CA focuses only on the material to be removed and does not use the full CERCLA criteria. Both time-critical and non-time critical removal actions require that a public comment period be held in order that the public be afforded an opportunity to comment on the removal.

Subsequent to a removal action, the FS may conclude that no further action is required to reduce the threat to human health and the environment. In this case, a no action ROD would be issued and the CERCLA remedial process would be concluded.

3.1.4 Interim Remedial Action

An interim remedial action may be completed prior to or during the RI/FS to reduce the threat to human health or the environment by removing released hazardous substances or reducing potential exposure pathways. In order to select the best remedial alternative for an interim remedial action, a focused FS may be prepared. An interim action must be consistent with the anticipated long-term remedial action. An interim ROD is issued and interim remedial design and remedial action activities are initiated.

3.1.5 Remedial Design/Remedial Action (RD/RA)

The ROD establishes the scope of the RA. The RD often proceeds in a stepped process and addresses detailed design issues not addressed during the FS. The RA involves implementation of the RD. The FFA establishes a process for developing an RD/RA schedule.

4.0 SITE RANKING

This section provides a description of the relative risk ranking procedure and a summary of relative ranking results. Results of the risk ranking procedure are intended to assist in prioritizing site cleanups.

4.1 RELATIVE RISK SITE EVALUATION FRAMEWORK

The DOD has developed a Relative Risk Site Evaluation framework as a means of categorizing sites in the Defense Environmental Restoration Program (DERP) into High, Medium, and Low relative risk groups. The ranking of sites is not a substitute for a baseline risk assessment of health assessment nor a means of placing sites into a no further action category. The categorization of sites into relative risk groups is based on an evaluation of contaminants, pathways, and human and ecological receptors for groundwater, surface water and sediment, and surface soils. Although the air medium is not directly addressed by the Relative Risk Site Evaluation, the soil medium PRGs do include consideration for inhalation of airborne contaminants as a soil exposure pathway. The PRGs combine current USEPA toxicity values with "standard" exposure factors to estimate concentrations in environmental media (soil, sediment, air, surface water, and groundwater) that are protective of humans, including sensitive groups, over a lifetime. Each of these environmental media are evaluated using three factors:

- The Contaminant Hazard Factor (CHF)
- The Migration Pathway Factor (MPF)
- The Receptor Factor (RF)

The CHF is a combined measure of contaminant concentrations in a given environmental medium. CHF ratings are either "significant", "moderate", or "minimal" for each media. CHF rating is determined based on the ratio of the maximum concentration of a contaminant in each media (groundwater, surface water and sediment, surface soil) to a risk-based concentration standard for that contaminant (MPS or PRG). For media containing more than one contaminant, the ratios are added.

The MPF is a measure of the movement or potential movement of contamination away from the original source. MPF ratings are either "evident," "potential," or "confined" for each media. A rating of "evident" means that analytical data or observable evidence indicates that contamination in the media is moving away from the source, or contamination is present at, is moving towards, or has moved to a point of exposure. A rating of "potential" indicates the possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of "evident" or "confined." A rating of "confined" indicates that the potential for contaminant migration from the source is limited or a low possibility for contamination to be present at or migrate to a point of exposure.

The RF is an indication of the potential for human or ecological contact with site contaminants. RF ratings are either "identified," "potential," or "limited" for each media. A rating of "identified" indicates that receptors have been identified that have access to contaminated media. A rating of "potential" indicates potential for receptors to have access to contaminated media. A rating of "limited" indicates that there is little or no potential for receptors to have access to contaminated media.

Sites lacking reliable concentration data will be designated as "not evaluated" and will then be deferred, programmed for additional data collection, a removal action if warranted, or another appropriate response action before they are evaluated.

Upon determination of the CHF, MPF, and RF a decision matrix is utilized to determine the category of relative risk for each media. Relative risk categories are High, Medium, and Low. The highest rating resulting from the evaluation of the three media becomes the relative risk category of the site. A site's rating may change based on new or additional information or as a result of remediation activities.

The results of the Relative Risk Site Evaluation are used, in conjunction with other risk management concerns, to assist in the sequencing of remedial work. Appendix A contains the Defense Environmental Cleanup Program Fact Sheets from the Relative Risk Site Evaluation Primer (available at https://www.denix.osd.mil/denix/Public/Library/Cleanup/CleanupOfc/Documents/Cleanup/relrisk_app_e.pdf). The fact sheets provide an explanation of the evaluation concept and answers to frequently asked questions related to the evaluation.

4.2 SUMMARY OF SITE RISK RANKING FOR PNS

A summary of relative risk ranking results is shown on Table 4-1. Complete relative risk ranking results are included as Appendix B.

TABLE 4-1

RELATIVE RISK RANKING RESULTS
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Site/Site	Name	Rank
Site 10	Former Battery Acid Tank No. 24	High
Site 21*	Former Acid/Alkaline Drain Tank	Low
Site 6	DRMO and Impact Area	High
Site 29	Former Teepee Incinerator Site	High
Site 8	JILF and Impact Area	High
Site 9	Former Mercury Burial Sites (MBI and MBII)	Low
Site 11	Former Waste Oil Tanks Nos. 6 & 7	High
Site 5	Former Industrial Waste Outfalls	High
Site 26	Portable Oil/Water Tanks	Low
--	Offshore Areas (Offshore impacts from Sites 5, 6, 8, 9, 10, 26, 27)	High
Site 27	Berth 6 Industrial Area	High
Site 30	Galvanizing Plant, Building 184	High
Site 31	West Timber Basin	Low
Site 32	Topeka Pier Site	High
Site 34	Former Oil Gasification Plant, Building 62	High

* Site 21 groundwater currently under investigation as part of Site 31

5.0 SCHEDULE

Schedules for OU1, OU2, OU3, OU4, OU7, OU8, OU9, and Site 30 are attached as Appendix C.

5.1 SCHEDULE DEVELOPMENT

The schedules were developed using the current status of activity for each site at PNS, anticipated activities and projected funding availability. Line item durations were developed using the FFA. The FFA provides durations for specific process activities. The FFA describes "deliverables" required during the cleanup process. These documents are separated into two categories; primary and secondary documents.

Primary documents are developed by the Navy and are initially provided as a draft. The Navy provides responses to comments received on draft documents and following resolution a draft final document is prepared. The draft and draft final documents are subject to review by the USEPA, MEDEP, and Restoration Advisory Board (RAB). If no comments are received on the draft final version, it becomes the final document. If comments are received, the necessary modifications will be made and the final Primary Document will be issued. Secondary documents, as listed in the FFA, also undergo review; however, a draft final version is not provided.

5.2 SCHEDULE DURATIONS

Section 10.0 of the FFA defines review, response and revision time frames for Primary and Secondary documents.

Section 12.0 of the FFA defines the schedule for updating the SMP.

6.0 DOCUMENTS

Documents completed before the signature of the FFA and after signature of the FFA are provided in Sections 6.1 and 6.2, respectively.

6.1 DOCUMENTS COMPLETED BEFORE SIGNATURE OF FFA

The following documents were completed prior to the FFA being signed in September 1999:

Document	Date
Initial Assessment Study	June 1983
Final Confirmation Study Report on Hazardous Waste Sites	May 1986
RCRA Facility Assessment	July 1986
RCRA Facility Investigation Proposal	August 1989
Addendum to RCRA Facility Investigation Proposal	February 1991
Interim Human Health Risk Assessment for Quarters S, N, and 68	April 1991
RCRA Facility Investigation Work Plan	August 1991
Work/Quality Assurance Project Plan for the EERA	September 1991
Interim Human Health Assessment for the Day Care Center	October 1991
Revised Ambient Air Quality Monitoring Report	April 1992
Draft RCRA Facility Investigation Report for Onshore SWMUs (Remedial Investigation)	July 1992
On-Shore Ecological Risk Assessment of Portsmouth Naval Shipyard	August 1992
Interim Corrective Measures at the DRMO	April 1993
Final Hazard Ranking System Package	May 1993
Addendum to RCRA Facility Investigation Report	June 1993
Background Soil Sampling Work Plan	August 1993
Work/Quality Assurance Plan for Phase II of EERA	February 1994
Public Health and Environmental Risk Evaluation Part A: Human Health Risk Assessment Report	March 1994
Final On-Shore Media Protection Standards Proposal	April 1994
Final Human Health Risk Assessment Report for Offshore Media for Portsmouth Naval Shipyard	May 1994
Chapter 3: Media Protection Standards for Off-Shore Media; Sediment and Surface Water	June 1994
RCRA Facility Investigation Data Gap Work Plan	June 1994
Phase II Ambient Air Quality and Meteorological Monitoring Program Work Plan	July 1994
Estuarine Ecological Risk Assessment Case Study for Portsmouth Naval Shipyard	December 1994

Document	Date
Phase II Ambient Air Quality and Meteorological Monitoring Report (included in FFA, finalized June 1996)	March 1995
Draft On-Shore Feasibility Study Report	March 1995
Draft Interim Ground Water Monitoring Plan (included in FFA, finalized November 1996)	May 1995
Chapter 2: Media Protection Standards for Off-Shore Media Based on Human Health Risks (included in FFA, finalized in April 1996)	June 1995
Draft Final Estuarine Ecological Risk Assessment (included in FFA, revised draft final dated April 1997, finalized May 2000)	July 1995
RCRA Facility Investigation Data Gap Report	November 1995
Chapter 2: Media Protection Standards for Off-Shore Media Based on Human Health Risks	April 1996
Phase II Ambient Air Quality and Meteorological Monitoring Report	June 1996
Community Relations Plan for Portsmouth Naval Shipyard	October 1996
Consensus Document, No Further Action for Soils, SWMU 21	October 1996
Technical Memorandum on Seep Sampling for Portsmouth Naval Shipyard	November 1996
Interim Groundwater Monitoring Plan	November 1996
On-Shore/Off-Shore Contaminant Fate and Transport Modeling Phase I Work Plan	December 1996
Draft On-Shore/Off-Shore Contaminant Fate and Transport Modeling Phase I Report	February 1997
Technical Memorandum on Risk Evaluation of Surface Soils from Jamaica Island Landfill Site	May 1997
Engineering Evaluation/Cost Analysis for MBI	June 1997
Decision Document, No Further Action, SWMUs 12, 13, 16, and 23	July 1997
MBI Action Memorandum	September 1997
MEDEP Evaluation of Heavy Metal Migration at Portsmouth Naval Shipyard with Geochemical Modeling	December 1997
On-Shore/Off-Shore Contaminant Fate and Transport Modeling Phase I Report Addendum	December 1997
Work Plan, Teepee Incinerator (Site 29) and Building 238 (Site 10)	March 1998
Site Screening Process Plan for PNS	March 1998
Work Plan – Site 30 (Building 184), Site 31 (West Timber Basin), and Site 32 (Topeka Pier)	April 1998
Work Plan for MTADS Geophysical Mapping at PNS	July 1998
Phase II On-Shore/Off-Shore Contaminant Fate and Transport Modeling Work Plan	August 1998
Phase I/Phase II Data Comparative Analysis Report	October 1998
Proposed Plan for Interim Action at OU4	October 1998

Document	Date
Interim Record of Decision for Operable Unit 4	May 1999
Technical Memorandum Lead Contamination at DRMO Impact Area (finalized February 2000)	July 1999
Groundwater Monitoring Summary Report	August 1999
Proposal for Evaluation of Seep/Sediment Data	September 1999

6.2 DOCUMENTS COMPLETED AFTER SIGNATURE OF FFA

The following documents were completed from October 1999 (after the FFA was signed) to September 30, 2006:

Document	Date
Interim Offshore Monitoring Plan for Operable Unit 4	October 1999
Removal Action Work Plan for DRMO Shoreline Stabilization	October 1999
On-Shore/Off-Shore Contaminant Fate and Transport Phase II Modeling Report	December 1999
Technical Memorandum OU2 Risk Assessment Protocol	December 1999
Technical Memorandum Lead Contamination at DRMO Impact Area	February 2000
Work Plan for Mercury Burial Vault II and Drum Investigation	February 2000
Field Investigation Report Site 10 (Building 238) and Site 29 (Teepee Incinerator)	March 2000
Field Investigation Report Site 30 (Building 184), Site 31 (West Timber Basin), and Site 32 (Topeka Pier)	May 2000
Facility Background Development	May 2000
Revised OU3 Risk Assessment	May 2000
Estuarine Ecological Risk Assessment	May 2000
Seep/Sediment Summary Report	August 2000
Test Pitting Investigation Report	October 2000
Revised OU2 Risk Assessment	November 2000
Feasibility Study for OU3	November 2000
Proposed Remedial Action Plan for OU3	January 2001
Work Plan for Building 184 Subfloor Investigation	February 2001
Final Action Memorandum Site 6, DRMO, Shoreline Stabilization	June 2001
Final Drum Removal Report for Drum Investigation	June 2001
Final Closeout Report for Mercury Burial Vault Site I	June 2001
Final Removal Action Report for Mercury Burial Vault Site II	June 2001
Operable Unit 3 Pre-design Investigation Quality Assurance Project Plan	August 2001
Record of Decision for Operable Unit 3	August 2001

Document	Date
Decision Document for Site 26	August 2001
Decision Document for Site 27	August 2001
Site 10 Additional Investigation Quality Assurance Project Plan	October 2001
Preliminary Remediation Goals for Operable Unit 4	November 2001
MTADS Geophysical Survey of JILF and Topeka Pier	December 2001
Test Pitting Investigation at Site 30, Building 184	May 2002
OU3 Phase I Remedial Design	June 2002
OU3 Technical Memorandum for the Evaluation of MBII Waste Consolidation and Jamaica Cove Options	June 2002
Jamaica Island Landfill Phase I Waste Consolidation Remedial Design Work Plan	June 2002
Baseline Interim Offshore Monitoring Report for Operable Unit 4	July 2002
OU3 Phase II Remedial Design	November 2002
Site 30 Engineering Evaluation/Cost Analysis	December 2002
OU3 Phase II Remedial Design Work Plan	January 2003
Site 10 Additional Investigation Report	March 2003
Site 32 Remedial Investigation Quality Assurance Project Plan	March 2003
Site 34 Site Investigation Quality Assurance Project Plan	March 2003
Addendum to Site 32 Remedial Investigation Quality Assurance Project Plan	August 2003
Explanation of Significant Differences for the Record of Decision for OU3	September 2003
Former CDC Area Investigation Report	April 2004
Technical Memorandum Site 32 Phase I Remedial Investigation Evaluation Results	June 2004
Site Screening Investigation Report for Site 34	August 2004
Rounds 1 through 7 Interim Offshore Monitoring Report for Operable Unit 4	November 2004
Additional Scrutiny Quality Assurance Project Plan for Operable Unit 4	August 2005
Engineering Evaluation/Cost Analysis for Site 30 (Revision 1)	August 2005
Engineering Evaluation/Cost Analysis for Site 34	September 2005
Explanation of Significant Difference for the Record of Decision for OU3	October 2005
Time Critical Removal Action Work Plan for DRMO (Site 29) Shoreline Stabilization	October 2005
OU2 Screening-Level Soil Washing Treatability Study Report	January 2006
Action Memorandum for Non-Time-Critical Removal Action for Site 30	January 2006
Action Memorandum for Non-Time-Critical Removal Action for Site 34	February 2006
Work Plan for Site 29 Removal of Waste Debris and Site 32 Shoreline Stabilization	April 2006
OU3 Remedial Action Report (for the Jamaica Island Landfill Phase I Waste Consolidation and Phase II Cap Construction)	May 2006
Site 10 Data Gap Investigation Quality Assurance Project Plan	June 2006
Post-Remedial Operation, Maintenance and Monitoring Plan for OU3	June 2006

Document	Date
Closeout Report for Site 29 Removal of Waste Debris and Site 32 Shoreline Stabilization	September 2006

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APPENDIX A

DEFENSE ENVIRONMENTAL CLEANUP PROGRAM FACT SHEETS

(From Appendix E of the Relative Risk Site Evaluation Primer)

A.1 RELATIVE RISK SITE EVALUTION CONCEPT

A.2 RELATIVE RISK SITE EVALUATION QUESTIONS AND ANSWERS

APPENDIX A.1

RELATIVE RISK SITE EVALUTION CONCEPT

Office of the Deputy Under Secretary of Defense
(Environmental Security)

Defense Environmental Cleanup Program Fact Sheet

The Relative Risk Site Evaluation Concept

Introduction

The Department of Defense (DoD) considers environmental restoration as an integral part of its daily mission activities. At installations around the country, environmental restoration activities are underway to address contamination resulting from past DoD operations. Environmental analysis and cleanup activities address a wide variety of sites contaminated with fuels, solvents, chemicals, heavy metals, and common industrial materials.

Given the large number of sites to be addressed and limitations on money and people to work on these sites each year, DoD believes that a risk-based approach should be applied to work sequencing at active military installations, Base Realignment and Closure (BRAC) installations, and formerly used defense properties using relative risk as a key factor. The relative risk site evaluation framework described in this fact sheet provides a means of helping accomplish this objective.

The framework for evaluating site relative risk was published in September 1994, in the *Relative Risk Site Evaluation Primer (Interim Edition)* which contained instructions for performing relative risk site evaluations at sites across DoD. A revised edition of the Primer was issued in June 1996.

Definition of Relative Risk Site Evaluation

The relative risk site evaluation framework is a methodology used by all DoD Components to evaluate the relative risk posed by a site in relation to other sites. It is a tool used across all of DoD to group sites into high, medium, and low categories based on an evaluation of site information using three factors: the contaminant hazard factor (CHF), the migration pathway factor (MPF), and the receptor factor (RF). Factors are based on a quantitative evaluation of contaminants and a qualitative evaluation of pathways and human and ecological receptors in the four media most likely to result in significant exposure—groundwater, surface water, sediment, and surface soils. A representation of this evaluation concept is presented in Figures 1 and 2. Figure 1 also depicts possible opportunities for stakeholder input into the technical evaluation.

The relative risk site evaluation framework is a qualitative and easy to understand methodology for evaluating the relative risks posed by sites and should not be equated with more formal risk assessments conducted to assess baseline risks posed by sites. It is a tool to assist in sequencing environmental restoration work (i.e., known requirements such as remedial investigation or cleanup actions) to be done by a DoD Component. It is designed to handle the broad range of sites that exist at DoD installations and the broad range of data available. The grouping of sites into high,

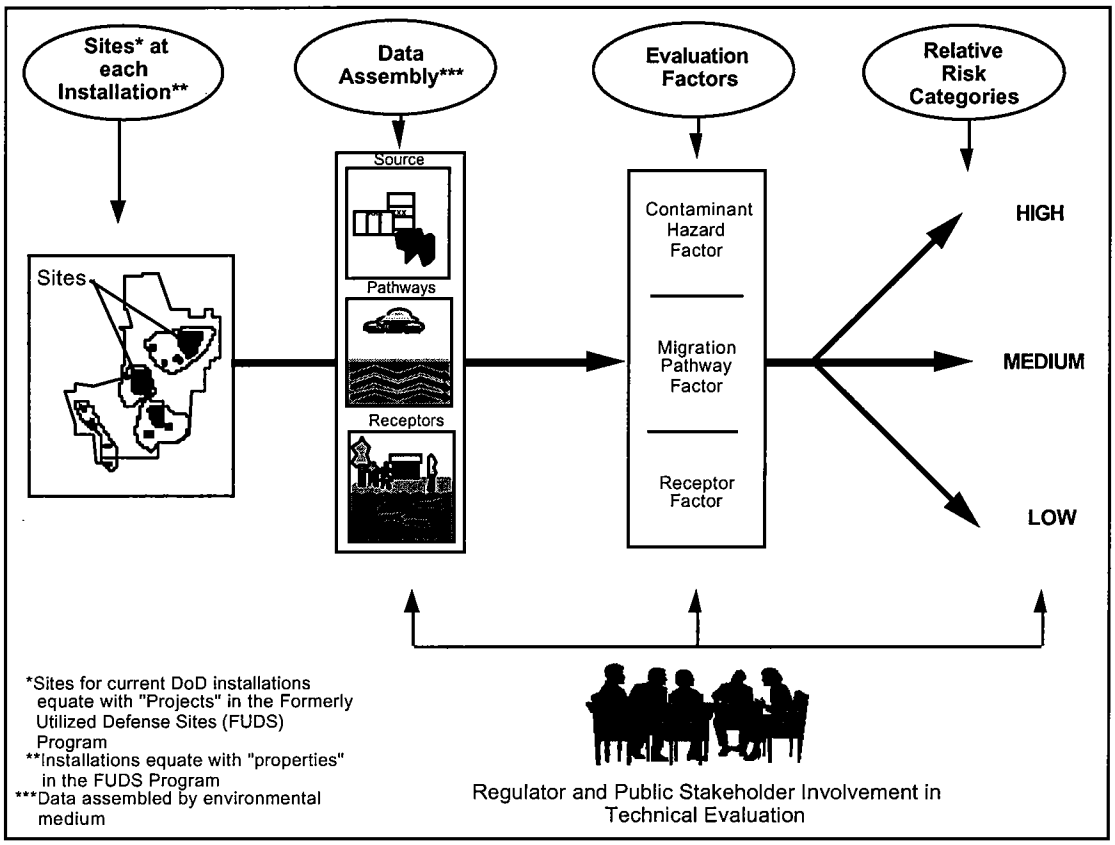

Figure 1. Relative Risk Site Evaluation Concept Summary

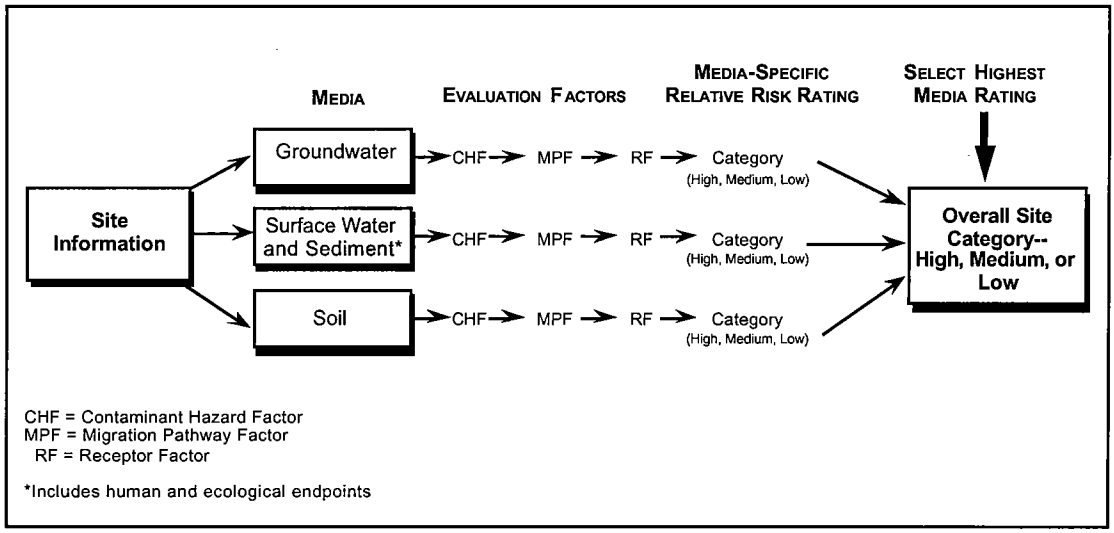

Figure 2. Flow Diagram of the Relative Risk Site Evaluation Framework

medium, or low relative risk categories **is not** a substitute for either a baseline risk assessment or health assessment; **it is not** a means of placing sites into a Response Complete/No Further Action category; and **it is not** a tool for justifying a particular type of action (e.g., the selection of a remedy).

Use of the relative risk site evaluation framework is restricted to environmental restoration sites and does not extend to unexploded ordnance (UXO) removal, building demolition/debris removal (BD/DR), potentially responsible party (PRP) activities, or compliance activities.

Relative Risk and Funding Decisions

Relative risk is not the sole factor in determining the sequence of environmental restoration work, but it is an important consideration in the priority setting process. It should be factored into all priority setting decisions, and should be discussed with regulators and public stakeholders in the environmental restoration process.

The actual funding priority for a site is identified after relative risk information is combined with other important risk management considerations (e.g., the statutory and regulatory status of a particular installation or site, public stakeholder concerns, program execution considerations, and economic factors). These additional risk management considerations can result in a decision to fund work at a site that is not classified as a high relative risk. DoD Components have each developed guidelines for combining relative risk and risk management considerations as part of their planning, programming, and budgeting process.

The relative risk site evaluation framework does not address the question of whether work is necessary at a site; it only provides information for use in helping to determine the general sequence in which sites will be addressed. At the DoD headquarters level, it also provides a framework for planning, programming, and budgeting requirements, a topic discussed below.

Requirements for Relative Risk Site Evaluations

Relative risk site evaluations are required for all sites at active military installations, BRAC installations, and formerly used defense properties that have future funding requirements that are not classified as (1) having "all remedies in place," (2) "response complete," (3) lacking sufficient information, or (4) abandoned ordnance. These four situations are discussed in the following four paragraphs.

Relative risk site evaluations are not required (NR) for sites classified as having all remedies in place (RIP) even though they may be in remedial action operation (RAO) or long-term monitoring (LTM). A RIP determination requires that remedial action construction is complete for a site.

Relative risk site evaluations are not required (NR) for sites classified as response complete (RC). Sites classified as RC are those where a DoD Component deems that no further action (NFA) is required with the possible exception of LTM. An RC determination requires that one of the following apply: (1) there is no evidence that contaminants were released at the site, (2) no contaminants were detected at the site other than at background concentrations, (3) contaminants attributable to the site are below action levels used for risk screening, (4) the results of a baseline risk assessment demonstrate that cumulative risks posed by the site are below established thresholds, or (5) removal and/or remedial action operations (RAOs) at a site have been implemented, completed, and are the final action for the site. Only LTM remains.

Relative risk site evaluations should be based on the information currently available on contaminants, migration pathways, and receptors. Sites lacking sufficient information for the conduct of a

relative risk site evaluation should be given a "Not Evaluated" designation and should then be programmed for additional study, a removal action if warranted, or other appropriate response action, including deferral, before they are evaluated.

Sites comprised solely of abandoned ordnance are not subject to the relative risk site evaluation described in this Primer. Such sites should be evaluated using a separate risk procedure, which is discussed in the management guidance cited above (Office of the Under Secretary of Defense [Environmental Security], 1994).

Implementation of the Relative Risk Site Evaluation Framework

DoD's goal is to conduct relative risk site evaluations at the field level with the involvement of the regulators and public stakeholders (see Figure 1). The technical evaluation of sites using the evaluation framework can serve as a basis for discussion and negotiation with regulators and public stakeholders. In particular, regulators and public stakeholders can help identify receptors, and can make judgments about the extent of contaminant migration in various environmental media at a site. Where they exist, Restoration Advisory Boards (RABs) are an excellent forum for obtaining public stakeholder input on these aspects of site relative risk. Other opportunities for public stakeholder involvement may also be appropriate. Regulators and public stakeholders should always be given the opportunity to participate in the development and review of relative risk site evaluation data before the data is used in planning and programming.

Management Uses of Relative Risk Information

DoD and DoD Components are using the relative risk site evaluation framework as a tool to help sequence work at sites and as a headquarters program management tool. As a program management tool, the framework is being used by DoD and DoD Components to periodically identify the distribution of sites in each of three relative risk categories—high, medium, and low. A series of discrete relative risk site evaluations provides headquarters program managers with a macro-level view of changes in relative risk distributions within DoD over time.

The relative risk site evaluation framework and resulting data also provide DoD with a basis for establishing goals and performance measures for the environmental restoration program. In this regard, DoD has established goals for all DoD Components to reduce relative risk at sites in Defense Environmental Restoration Account (DERA) and BRAC programs or to have remedial systems in place where necessary for these sites, within the context of legal agreements. DoD and DoD Components are tracking progress towards these relative risk reduction goals as one of several program measures of merit (MOMs) at the headquarters level. Another MOM tracks the number of sites where cleanup action has been taken and relative risk has been reduced in one or more media. Resultant information is used to provide the necessary feedback to develop and adjust program requirements and budget projections, as well as to assess whether established goals reflect fiscal reality.

For More Information

At the Installation, contact

At DoD Headquarters, contact the Office of the Deputy Under Secretary of Defense (Environmental Security - Cleanup) at 703/697-7475.

APPENDIX A.2

RELATIVE RISK SITE EVALUATION QUESTIONS AND ANSWERS

Office of the Deputy Under Secretary of Defense
(Environmental Security)

Defense Environmental Cleanup Program Fact Sheet

Relative Risk Site Evaluation Questions & Answers

Q.1 *How is relative risk information being used by the Department of Defense (DoD) and military services at the field and headquarters levels?*

A. Field activities within the DoD use relative risk information as one means of representing the status of their environmental restoration program to DoD, regulators, and local stakeholders. Information on site relative risk is used by each military installation or formerly used defense site, in conjunction with other risk management considerations, to help sequence work at sites in light of available resources within DoD.

Headquarters environmental restoration program offices within each military service collect relative risk information from each field activity to identify to Congress, regulators, and other stakeholders the distribution of sites in each of three relative risk categories–high, medium, and low. A series of discrete relative risk site evaluations provides headquarters program managers with a macro-level view of changes in relative risk distributions within DoD over time. In the event of budget cuts or recessions, Headquarters Program Offices will consider the relative risk of sites along with other risk management considerations in the resultant deferral of projects. In general, low relative risk sites will be deferred before medium relative risk sites, and medium relative risk sites will be deferred before high relative risk sites. At the installation or field level, specific work program adjustments will be made considering relative risk and other risk management concerns in the event that budget cuts or recessions occur.

Relative risk information will also be used to provide DoD with a basis for establishing goals and performance measures for the environmental restoration program. In this regard, DoD has established goals for all DoD Components to reduce relative risk at sites or to have remedial systems in place where necessary for these sites, within the context of legal agreements. Military services and DoD will track changes in relative risk towards these relative risk reduction goals as a measure of merit (MOM). Relative risk will not be used to set cleanup standards, nor will it be used as a basis for making remedial action decisions, remedy selection decisions, or no further action decisions.

Q.2 *How are other risk management considerations taken into account for priority setting?*

A. Relative risk is not the sole factor in determining the sequence of environmental restoration work, but it is an important consideration in the priority setting process. It should be

factored into all priority setting decisions, and should be discussed with regulators and public stakeholders in the environmental restoration process.

The actual funding priority for a site is identified after relative risk information is combined with other important risk management considerations (e.g., the statutory and regulatory status of a particular installation or site, public stakeholder concerns, program execution considerations, and economic factors). These additional risk management considerations can result in a decision to fund work at a site that is not classified as a high relative risk. Military services have each developed guidelines for combining relative risk and risk management considerations as part of their planning, programming, and budgeting process.

Q.3 *What is the role of the community in evaluating relative risk at sites?*

A. Community members of Restoration Advisory Boards and other members of the public participate in the technical evaluation of relative risk at a variety of levels depending on their desire for involvement. At some installations and formerly used defense sites, community members have received relative risk training and participate directly in the evaluation of relative risk factors for each environmental medium at a site. At other installations and formerly used defense sites, community members review and provide input into relative risk evaluations prepared by installation personnel. DoD intends to increase community input into relative risk evaluations at all installations and formerly used defense sites where there is sufficient interest. To increase community awareness of and access to guidance on performing relative risk site evaluations, DoD has placed the *Relative Risk Site Evaluation Primer* on the DoD Environmental Restoration Electronic Bulletin Board, a World Wide Web site at http://www.dtic.dla.mil/envirodod/envdocs.html.

Q.4 *What is the role of regulatory agencies in evaluating relative risk at sites?*

A. State and federal regulatory agency personnel are key participants in the relative risk evaluation process. Their involvement in this process largely depends on their degree of involvement in an environmental restoration program at a particular installation or formerly used defense site. At some installations or formerly used defense sites, regulatory agency personnel have received relative risk training and participate directly in the evaluation of relative risk factors for each environmental medium at a site. Discussions with regulatory agency personnel on relative risk at these training sessions and at project team meetings at installations have proven helpful in increasing regulatory acceptance of relative risk. DoD seeks to increase regulatory involvement in relative risk evaluations at all appropriate installations and formerly used defense sites.

Q.5 *How often will field activities need to conduct relative risk site evaluations?*

A. Relative risk at sites should be evaluated whenever important new information about a site becomes available. DoD will collect information on site relative risk from the military services on a semi-annual basis, once in the middle of the fiscal year and once at year end.

Q.6 *Will progress in the environmental restoration program be measured on the basis of Relative Risk?*

A. Yes, for the following reasons. Progress at sites in DERP has traditionally been measured by reporting on the response status of sites at the field and headquarters level (e.g., number of sites with responses complete). While these traditional measures of progress are still important measures, DoD planning guidance for Fiscal Years (FYs) 1998-2002 establishes goals for all military services to reduce relative risk at sites. The planning guidance specifically requires (1) military services to implement actions that lower relative risk for all high relative risk within specific time frames or have remedial systems in place where necessary for these sites, (2) implement actions that lower relative risk of all medium relative risk sites within a specific time frame or have remedial systems in place where necessary for those sites, and (3) implement actions that result in "response complete" for all relative risk sites within a set time frame.

Q.7 *Does relative risk site evaluation apply to sites at Base Realignment and Closure (BRAC) installations?*

A. Yes. DoD planning guidance requires that available restoration funds at BRAC installations be used to implement actions to lower relative risk for all high relative risk sites within specific time frames or have remedial systems in place where necessary for these sites.

Q.8 *What is the relationship between the Relative Risk Site Evaluation Framework and risk assessment?*

A. Relative risk evaluation and risk assessment share a common conceptual framework, but have significant differences in purpose and methodology. First and foremost, relative risk evaluation is not a substitute for a risk assessment. It is a screening-level evaluation of site information at a point in time based on three factors: the contaminant hazard factor (CHF), the migration hazard factor (MPF), and the receptor factor. In terms of hazard assessment, the relative risk framework uses maximum (worst-case) contaminant data, while risk assessment uses average and/or reasonable maximum concentrations of contaminants. For exposure assessment, the relative risk framework relies on a qualitative evaluation of fate and transport of contaminants away from a source, while risk assessment emphasizes quantitative predictions of contaminant fate and transport. In terms of toxicity assessment, both relative risk and risk assessment use similar data. The relative risk framework uses concentration standards *derived from* preliminary remediation goals that are calculated using the same toxicity data used in risk assessment. In terms of results, relative risk information is used at the field level to help sequence work at sites. Risk assessment results are typically used to determine whether or not additional response actions are warranted at a site.

Q.9 *Why were the Environmental Protection Agency (EPA) preliminary remediation goals (PRGs) multiplied by 100 for carcinogens?*

A. PRGs are concentrations of contaminants in a specific medium that have been estimated to (1) cause 1 excess cancer occurrence per 1,000,000 people over the course of a 70-year life-time or (2) cause non-cancer adverse effects (e.g., birth defects, neurological problems). These values have been calculated through the use of toxicity data found in EPA databases and by using conservative assumptions (e.g., a person will obtain all water for drinking and showering over a 30-year period

from the same source). The methods used by EPA for calculating "safe" doses for cancer-versus-noncancer effects differ dramatically. Noncancer effects have thresholds (levels of exposure that do not cause toxicity), while cancer effects are not assumed to have a threshold. The differing assumptions for noncancer and cancer effects mean that respective toxicities are handled differently when setting acceptable exposures. For cancer-inducing agents, mathematical formulas are used to determine acceptable exposure levels. For noncancer toxicants, a "reference dose" that is related to the threshold is used. Threshold doses are generally much higher than are doses that cause 1 in 1,000,000 cancer occurrences.

In Office of Solid Waste and Emergency Response (OSWER) Directive 9355.0-30, dated 22 April 1991, the *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions*, EPA states that action is generally not warranted if reasonable maximum contaminant exposures at a site are less than the reference dose or cause fewer than 1 in 10,000 excess cancer occurrences. This is consistent with the remedial action threshold for carcinogens defined in the Preamble to the National Oil and Hazardous Substances Pollution Contingency Plan (55 Federal Register 8716, March 8, 1990). This means that EPA has made the reference dose equivalent to 1 in 10,000 cancer occurrences for screening purposes. Because PRGs are reference doses and concentrations of contaminants that result in 1 in 1,000,000 cancer occurrences, the PRGs for cancer agents are 100 times smaller than the equivalence set by OSWER Directive 9355.0-30. Multiplying the cancer PRGs by 100 restores the equivalence for purposes of relative risk evaluation.

Q.10 *What is the relationship between Maximum Contaminant Levels (MCLs) and concentration standards in Appendix B-1?*

A. MCLs, established by EPA under the Safe Drinking Water Act, apply to water supplies used for human consumption. Under the Comprehensive Environmental Response, Compensation, and Liability Act, as amended (CERCLA), MCLs are often considered applicable or relevant and appropriate requirements for groundwater response actions. Some MCLs are risk-based, while others are technology-based. When compared to concentration standards in Appendix B-1, results are mixed. For noncancer toxicants, concentration standards in Appendix B-1 are generally equivalent to or lower than MCLs. For cancer-causing agents, concentration standards in Appendix B-1 (equivalent to 1 in 10,000 excess cancer occurrences) are in some cases above MCLs and in others below MCLs depending in part on whether the MCL is risk-based or technology-based.

Q.11 *Why is the threshold for the CHF rating of "significant" set at 100?*

A. The relative risk site evaluation framework is a programmatic tool used to categorize sites that have requirements for future work into three broad bands called "high," "medium," and "low." In order to place the CHF in the appropriate perspective, it is important to note that neither the intent nor the application of relative risk evaluation is to classify risk in an absolute sense that defines what remedial action is required. Decisions regarding future work are made

separately on the basis of a remedial investigation, baseline risk assessment, and evaluation of the acceptability of the calculated risk. As stated in response to Question 16, a low overall site rating is not equivalent to a no further action decision. Thus, the descriptors used in the relative risk evaluation process such as "significant," "moderate," and "minimal," as applied to the CHF ratios, and "high," "medium," or "low," as applied to the overall site rating, must be considered relative terms to be used only in the relative rating of the sites under consideration. If there is insufficient data to categorize a site, it is identified as "Not Evaluated."

The threshold values for the CHF descriptors were chosen as 2 and 100 such that when the site CHF was combined with the other site rating factors, an approximately equal distribution of sites among the three overall categories of "high," "medium," and "low" would result. This was determined by testing the framework with various values of CHF thresholds at thousands of DoD sites. Each of the three site-rating factors, which are based on the three elements of the conceptual site model used in a baseline risk assessment, are intended to have a balanced and appropriate impact on the final overall site rating. The balanced weighting of the three factors is illustrated (see Figure 7 in the Primer) by the fact that a "moderate" CHF will result in a "high" overall site rating if an "identified" receptor exists and the MPF is either "evident" or "potential." Even with a "potential" receptor, a "high" overall rating will result if an "evident" pathway exists for a site with a "moderate" CHF. (Also see Question 13.)

Q.12 *Does the Relative Risk Site Evaluation Framework consider wetlands as an ecological receptor?*

A. Wetlands, in the broad sense of the definition, are present at a large number of DoD sites. As a result, maximum resolution of sites on the basis of relative risk to human health and ecological receptors is obtained by considering wetlands as ecological receptors when they are part of sensitive environments such as critical habitats, marine sanctuaries, spawning areas, and other such environments listed in Table 2 of the Primer.

Q.13 *What is the rationale for the assignment of ratings to the 27 combinations of the three factors used in the Relative Risk Site Evaluation Framework?*

A. The bottom line answer is that for relative risk site evaluation to be a useful programmatic tool, it had to result in placing a significant distribution of the evaluated sites into each of the three broad categories of "high," medium," and "low." The thresholds for each category were established by evaluating data from all the services to ensure that there would be a distribution of sites into each category. The choices of categories for the 27 possible combinations of the three different site characterization factors (depicted in Figures 3 and 7 of the Primer) are based on a balanced consideration of the three factors as they describe the degree of completion of exposure of receptors to contaminants. The logic of the assigned categories is perhaps best understood by considering the combinations depicted in Figure 7 of the Primer in light of the exposure scenarios represented by each of the 27 possibilities.

With a significant CHF, which represents a concentration of contaminant that is two orders of magnitude above the concentration standard (see Appendix B of the Primer), any combination of evident or potential migration pathway with an identified or potential receptor is assigned to be in the high category. Any potential for exposure to contaminants at this high relative concentration will receive highest priority. Only if either the migration pathway is confined (no migration to a point of exposure) or the receptors are limited (little or no receptor access to site) is the site placed in a medium category. If both migration is unlikely and receptor access is unlikely, the site is assigned a low rating. In this case, the contaminant, though present at high concentrations, will not be exposed to receptors and can await cleanup while other sites with a more certain scenario for exposure are addressed.

Sites with a moderate CHF, where concentrations of contaminants exceed concentration standards by factors of 2 to 100, also receive high ratings if migration is evident and receptors are identified, if migration is evident and receptors are potential, or if migration is potential and receptors are identified. These situations all represent likely exposure scenarios to concentrations of contaminant that exceed the concentration standards by more than a factor of 2. If both the migration and the receptors are potential, exposure is less likely and a medium rating is assigned. If migration is evident, even if the receptor is judged to be limited, a medium rating is also assigned to allow for the existence of an unanticipated receptor. In the case of confined migration (no migration to a point of exposure), all receptor possibilities are assigned a low rating because exposure is unlikely. The combination of potential migration and limited receptors is also assigned a low rating.

With a low CHF, where measured concentrations are less than twice the concentration standard, only sites with both evident migration and identified receptors are assigned a high rating. A high probability of exposure, even to this relatively low concentration, received the highest priority. Evident migration with potential receptors or potential migration with identified receptors both receive a medium rating because of the likelihood of exposure, albeit to a relatively lower concentration of contaminant. All other possibilities with this relatively lower concentration of contaminant receive a low rating.

Q.14 *What happened to the Defense Priority Model (DPM)?*

A. In 9 November 1993, testifying before the Senate Committee on Energy and Natural Resources, Sherri Goodman, Deputy Under Secretary of Defense (Environmental Security) stated the following: "...concerns have been raised about the use of DPM for determining program priorities and DoD has decided not to use the model on a DoD-wide basis."

Q.15 *How does the Relative Risk Site Evaluation Framework relate to the Hazard Ranking System (HRS)?*

A. Both the HRS and evaluation framework are screening tools that can be used to evaluate relative risks at waste sites. The HRS is an EPA regulation (40 Code of Federal Regulations 300, Appendix A) used to place sites or aggregates of sites on the National Priorities List (NPL) if scores are above 28.5. Although the HRS has the capability to differentiate among the

relative risk of sites, it is more frequently applied to identify candidate installations for the NPL. The relative risk framework is a tool used to group sites in high, medium, and low relative risk categories to help sequence work at installations or former defense sites given the available resources. The HRS evaluates groundwater, surface water, soil, and air pathways and considers human and ecological receptors (called targets). Each pathway in the HRS is evaluated using three factor categories (likelihood of release, waste characteristics, and targets) each of which is subdivided into a number of factors tied to site-related information. The relative risk framework evaluates groundwater, surface water, and surface soils and considers human and ecological receptors. Both the HRS and relative risk use toxicity data from EPA databases for assessing contaminants; however, only the HRS takes waste quantity into account. The HRS assigns a single score to a site between 0 and 100 from a one-time ranking that becomes permanent. The relative risk framework assigns a site a high, medium, or low rating at a point in time, but allows for re-evaluation of a site when important new information becomes available. HRS ranking is detailed, time-intensive, and requires significant support documentation. In addition, HRS evaluations are typically not specific to sites when applied to military installations. HRS evaluations are based on an aggregation of sites across an installation. Relative risk evaluation is simpler and more transparent than HRS evaluation, is applied site by site, but is subject to more judgment.

Q.16 *Will "low" relative risk sites be addressed or will they be deferred indefinitely?*

A. A low relative risk site is not equivalent to a no further action site. Appropriate response actions will be programmed for all low relative risk sites as dictated by available resources and other risk management considerations.

Q.17 *Does the Relative Risk Site Evaluation Framework apply to ordnance and explosive wastes?*

A. The relative risk evaluation framework applies specifically to hazardous, petroleum, and radioactive waste sites in the environmental restoration program. A separate methodology has been developed for grouping ordnance and explosive waste sites into high, medium, and low categories. This methodology is based on safety concerns, and results are tracked separately from other sites.

Q.18 *When are relative risk site evaluations not performed?*

A. Relative risk site evaluations are not required at sites classified as (1) having "all remedies in place," (2) "response complete," (3) lacking sufficient information, or (4) abandoned ordnance. These four situations are discussed in section 1.4 of the Primer.

APPENDIX B

PNS RELATIVE RISK SITE EVALUTION RANKING WORKSHEETS

Site # - SITE NAME	RANK
Site 5 - Former Industrial Waste Outfalls	High
Site 6 – DRMO and Impact Area	High
Site 8 – JILF and Impact Area	High
Site 9 – Former Mercury Burial Sites (MBI and MBII)	Low
Site 10 – Former Battery Acid Tank No. 24	High
Site 11 – Former Waste Oil Tanks Nos. 6 & 7	High
Site 21 – Former Acid/Alkaline Drain Tank	Low
Site 26 - Portable Oil/Water Tanks	Low
Site 27 - Fuel Oil Spill Area (Berth 6 Industrial Area)	High
Site 29 – Former Teepee Incinerator Site	High
Site 30 - Galvanizing Plant, Building 184	High
Site 31 - West Timber Basin	Low
Site 32 - Topeka Pier Site	High
Site 34 – Former Oil Gasification Plant, Building 62	High

RELATIVE RISK SITE EVALUATION SUMMARY

Site	Media	RF	MPF	CHF	CHF	Media Rank
5	SEDH	I	E	3.4	Mod	High
	SEDEM	I	E	250	Sig	High
6	GW	I	E	23	Mod	High
	SWH	I	E	< 1	Min	High
	SWEM	I	E	< 1	Min	High
	SEDH	I	E	3.5	Mod	High
	SEDEM	I	E	260	Sig	High
	SOIL	P	P	670	Sig	High
8	GW	I	E	68	Mod	High
	SWH	I	E	< 1	Min	High
	SWEM	I	E	640	Sig	High
	SEDH	I	E	3.5	Mod	High
	SEDEM	I	E	150	Sig	High
	SOIL	I	E	7.0	Mod	High
9	GW	L	C	< 1	Min	Low
	SOIL	L	C	2.7	Mod	Low
10	GW	I	E	41	Mod	High
	SEDH	I	E	< 1	Min	High
	SEDEM	I	E	8.0	Mod	High
	SOIL	P	P	490	Sig	High
11	GW	I	E	8.5	Mod	High
	SOIL	I	P	14	Mod	High
21	SOIL	P	C	4.9	Mod	Low
26	SEDH	I	C	3.5	Mod	Low
	SEDEM	I	C	35	Mod	Low
27	GW	I	E	1100	Sig	High
	SOIL	P	E	2.2	Mod	High
29	GW	I	E	26	Mod	High
	SOIL	I	E	520	Sig	High
30	GW	P	P	1.8	Min	Low
	SOIL	I	P	10	Mod	High
31	GW	L	P	27	Mod	Low
	SOIL	P	C	41	Mod	Low

RELATIVE RISK SITE EVALUATION SUMMARY

Site	Media	RF	MPF	CHF	CHF	Media Rank
32	GW	P	P	70	Mod	Medium
	SWEM	I	E	24	Mod	High
	SEDEM	I	E	1200	Sig	High
	SOIL	P	P	36	Mod	Medium
34	SEDEM	I	E	330	Sig	High
	SEDH	I	E	3.1	Mod	High
	SOIL	I	E	41	Mod	High

LEGEND

Site = Solid Waste Management Unit

Media

SEDH = Sediment, Human
SEDEM = Sediment, Ecological Marine
GW = Groundwater
SWH = Surface Water, Human
SWEM = Surface Water, Ecological Marine

RF = Receptor Factor

I = Identified
P = Potential
L = Limited

MPF = Migration Potential Factor

E = Evident
P = Potential
C = Confined

CHF - Contaminant Hazard Factor

Sig = Significant (CHF > 100)
Mod = Moderate (CHF of 2 to 100)
Min = Minimal (CHF < 2)

PORTSMOUTH NAVAL SHIPYARD
INSTALLATION RESTORATION PROGRAM

RELATIVE RISK SITE EVALUTION
SITE RANKING

APP Covers FY07 SMP Rev. 0

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Date Entered (Day, Month, Year): 9/9/96

Location (State): ~~NH~~ ME

Media Evaluated (GW, SW, Sediment, Soil): SEDH SEDEM

Site (Name/RMIS ID) / Project for FUDS: SWMU 00005

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): FS

RMIS Site Type: INDUSTRIAL DISCHARGE

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

Point of Contact (Name/Phone): Marty Raymond

National Priority List (Y/N): Yes **Site Rank:** High

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
Several discharge points for storm and sanitary sewer water discharges to the Piscataqua River were located at the western end of the Shipyard. During 1945 to 1975 industrial wastes were discharged to the river. Materials disposed: Industrial wastes from plating and battery shops including: industrial wastewater (metals, oils, greases, PCBs, cyanide and phenols), solvents and heavy metals The use of these outfalls was terminated in 1975.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
Surface water/sediment: Releases were to the Piscataqua River which is part of the Great Bay Estuary. Sediment and surface water has been impacted. In 1976, as part of a study for a proposed dredging project to deepen the berths, sediments in the areas of berths 6,11, & 13 were sampled and analyzed. The results indicated the presence of metals, oils, grease, PCBs, cyanide and phenols. The river as part of the estuary is a resource of tremendous value. Current use of the area includes commercial and recreational fishing, lobstering, clamming/oystering, and boating.

Brief Description of Receptors (Human and Ecological):
Human: Impacts on human health include ingestion of lobster, mussel and fin fish; demal contacts from surface water and sediments and surface water from swimming, wading and fishing. Ecological: There are five main habitats in the estuary: Eelgrass, mudflats (unvegetated), saltmarshes, channel, and shellfish (part of other habitats). Ecological receptor specifically include: lobster, shellfish, finfish, and other benthic fauna and flora.

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(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the (or RFA) phase that has not been entered into RMIS.

Sediment Human

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Arsenic (cancer endpoint)	28.7	21.0	1.370
Aluminum	77,900.0	75,000.0	1.040
Benzo[a]pyrene	2.2	5.6	0.390
Lead	124.0	400.0	0.310
Benz[a]anthracene	3.6	56.0	0.060
Nickel and compounds	91.2	1,500.0	0.060
Cadmium and compounds	2.0	37.0	0.050
Mercury and compounds (inorganic)	0.67	23.0	0.030
Polychlorinated biphenyls (PCBs)	0.35	20.0	0.020
Zinc	530.0	22,000.0	0.020
		Total:	**3.380**

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Studies of offshore media and biota indicate presence of contamination in the sediments.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Potential - Potential for receptors to have access to sediment

Limited - Little or no potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Receptors include recreational and occupational contact with contaminated sediments and co - nsumption of seafood taken from the Piscataqua River.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00005 **Sediment Human Category:** High
(High, Medium, Low)

Sediment Eco Marine

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
DDT	0.13		65.000
Chrysene	3.2	0.06	53.330
Pyrene	10.0	0.35	28.570
Phenanthrene	6.2	0.22	27.560
Fluoranthene	14.0	0.6	23.330
Benz[a]anthracene	3.6	0.23	15.650
Polychlorinated biphenyls (PCBs)	0.35	0.05	7.000
Chlordane, alpha-			6.000
Benzo[a]pyrene	2.2	0.4	5.500
DDE	0.01		5.000
		Total:	**253.680**

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): X

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Offshore investigations have found contamination present in the media and biota.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Potential - Potential for receptors to have access to sediment

Limited - Little or no potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Receptors include Piscataqua River biota from direct uptake and food chain ingestion.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00005 **Sediment Marine Category:** High
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Date Entered (Day, Month, Year): 5/16/95

Location (State): ~~NH~~ ME

Media Evaluated (GW, SW, Sediment, Soil): GW SWH SWEM SEDH SEDEM SOIL

Site (Name/RMIS ID) / Project for FUDS: SWMU 00006

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): FS

RMIS Site Type: STORAGE AREA

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

Point of Contact (Name/Phone): Marty Raymond

National Priority List (Y/N): Yes **Site Rank:** High

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
Approximately 2 acres of land which for more than 30 years has served as a temporary storage area for material prior to off-site disposal. Until 1983, there were few release controls at the storage yard. Ponding of precipitation in some areas and direct runoff to the Piscataqua River occurred during that era. Contamination occurred from open storage of batteries and other materials such as oil-laden tool and die scrap metals. In 1993 an interim corrective action was taken and a cap was installed on the unpaved sections of the yard. The cap consisted of a geocomposite clay liner, with geotextile above and below and topped with 12 inches of cursed stone choked with cement. Also a storm water catch basin with a trapped outlet was installed to trap floating contaminants such as oil and to discharge the storm water to the river. RMIS site type:

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
Groundwater: The site is at the edge of the Piscataqua River and above the former elevation of the shoreline. Previous to the installation of the cap in 1993 surface storm water infiltrated with little resistance through the surface soils, the blocky rock material beneath and into the river. The tidal fluctuations of the river essentially represent the groundwater under the storage yard. Surface water/sediment: Contaminated surface water and suspended sediment has reached the river through runoff and direct discharge to the river as well as percolation through the surface soils and blocky rock material in the subsurface. Soil: Metal contaminated soil mantles the bedrock over an area approximately 780 feet long by 160 feet wide.

Brief Description of Receptors (Human and Ecological):
Human: The receptors to the contaminants which migrated to the river would be finfish, shell fish and other biota within the Piscataqua River, eventually reaching humans through consumption. In addition the potential exists for the ingestion and adsorption of contaminated surface soils. The installation of the interim cap in 1993 was designed to stop particles from: (a) becoming windborn, (b) percolating through the surface soils and into the rocky subsurface and (c) being carried into the river via runoff. Ecological: There are five main habitats in the estuary: Eelgrass, mudflats (unvegetated), saltmarshes, channel, and shellfish (part of other habitats). Ecological receptors include: lobster, shellfish, fin fish, and other benthic fauna and flora., etc.

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(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the (or RFA) phase that has not been entered into RMIS.

Ground Water

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Lead	49.2	4.0	12.300
Dichloroethane, 1,2- (EDC)	73.0	12.0	6.080
Arsenic (cancer endpoint)	14.8	4.5	3.290
Mercury and compounds (inorganic)	4.5	11.0	0.410
Cadmium and compounds	4.5	18.0	0.250
Selenium	42.8	180.0	0.240
Acetone	48.0	610.0	0.080
Chromium (total)	14.95	180.0	0.080
Copper and compounds	112.0	1,400.0	0.080
Nickel and compounds	14.87	730.0	0.020
		Total:	**22.860**

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.

Confined - Information indicates that the potential for contaminant migration from the source is limited (due to geological structures or physical controls)

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Monitoring wells on-site and adjacent to the Piscataqua River indicate the presence of con - tamination.**

RECEPTOR FACTOR (RF)

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The GW (cont. or not) is a current drinking water source or is equiv. to (Class I or IIA aquifer).

Limited - There is no potentially threatened water supply well downgradient of the source. The groundwater is not considered a potential source of DW or is of limited benificial use (IIIA, IIIB or perched aquifer).

Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for DW, irrigation or agriculture, but not presently used (Class IIB aquifer).

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Groundwater flows into the Piscataqua River and contamination is available for uptake by p - lants and animals.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00006 **Groundwater Category:** High
(High, Medium, Low)

Soil

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Lead	255,000.0	400.0	637.500
Antimony and compounds	580.0	30.0	19.330
Aroclor-1254	7.5	0.97	7.730
Arsenic (cancer endpoint)	83.8	21.0	3.990
Benzo[a]pyrene	13.0	5.6	2.320
Nickel and compounds	2,670.0	1,500.0	1.780
Mercury and compounds (inorganic)	13.8	23.0	0.600
Cadmium and compounds	13.3	37.0	0.360
Benzo[b]fluoranthene	12.0	56.0	0.210
Benz[a]anthracene	7.7	56.0	0.140
		Total:	674.450

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): X

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination is present at, is moving towards, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Low possibility for contamination to be present at or migrate to a point of exposure

(Place an "X" next to one below)

Evident: _____

Potential: X

Confined: _____

Brief Rationale for Selection: **Surface soil samples indicate presence of contamination. Interim cap covers unpaved portions of the site except adjacent to the shoreline.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to contaminated soil

Potential - Potential for receptors to have access to contaminated soil

Limited - Little or no potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

Identified: _____

Potential: X

Limited: _____

Brief Rationale for Selection: **Occupational exposure to personnel working on site.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00006 **Soil Category:** High
(High, Medium, Low)

Surface Water Human

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Nickel and compounds	0.05	730.0	
Lead		4.0	
		Total:	

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): ____

Moderate (If Total 2 - 100): ____

Minimal (If Total < 2): X

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Information indicates a low potential for contamination to a potential point of exposure (could by due to the presence of geological structures or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: ____

Confined: ____

Brief Rationale for Selection: Studies of the Piscataqua River media and biota indicate contamination is present.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to surface water

Potential - Potential for receptors to have access to surface water

Limited - Little or no potential for receptors to have access to surface water

(Place an "X" next to one below)

Identified: X

Potential: ____

Limited: ____

Brief Rationale for Selection: Receptors include Piscataqua River plant and animal life and humans consuming seafood or contacting the surface water.

Activity Name KITTERY ME PORTSMOUTH NSY Site Name: SWMU 00006 Surface Water Human Category: High (High, Medium, Low)

Surface Water Eco Marine

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Nickel and compounds	0.05	8.3	0.010
Lead		8.5	
		Total:	0.010

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): X

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Studies of the Piscataqua River media and biota indicate contamination is present.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to surface water

Potential - Potential for receptors to have access to surface water

Limited - Little or no potential for receptors to have access to surface water

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Receptors include Piscataqua River biota.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00006 **Surface Water Marine Category:** High
(High, Medium, Low)

Sediment Human

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Arsenic (cancer endpoint)	28.7	21.0	1.370
Aluminum	77,900.0	75,000.0	1.040
Benzo[a]pyrene	2.2	5.6	0.390
Lead	124.0	400.0	0.310
Chromium (total)	211.0	3,000.0	0.070
Benz[a]anthracene	3.6	56.0	0.060
Nickel and compounds	91.2	1,500.0	0.060
Cadmium and compounds	2.0	37.0	0.050
Mercury and compounds (inorganic)	0.67	23.0	0.030
Polychlorinated biphenyls (PCBs)	0.35	20.0	0.020
		Total:	**3.450**

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Offhore investigations have found contaminated sediments and biota present.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Potential - Potential for receptors to have access to sediment

Limited - Little or no potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Recreational and occupational exposure.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00006 **Sediment Human Category:** High
(High, Medium, Low)

Sediment Eco Marine

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
DDT	0.13		65.000
Chrysene	3.2	0.06	53.330
Pyrene	10.0	0.35	28.570
Phenanthrene	6.2	0.22	27.560
Fluoranthene	14.0	0.6	23.330
Benz[a]anthracene	3.6	0.23	15.650
Polychlorinated biphenyls (PCBs)	0.35	0.05	7.000
Chlordane, alpha-			6.000
Benzo[a]pyrene	2.2	0.4	5.500
DDE	0.01		5.000
		Total:	256.320

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): X

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Offshore investigations have indicated contaminants present in the sediment and biota.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Potential - Potential for receptors to have access to sediment

Limited - Little or no potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Biota present within the Piscataqua River.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00006 **Sediment Marine Category:** High
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Location (State): ~~NH~~ ME

Site (Name/RMIS ID) / Project for FUDS: SWMU 00008

RMIS Site Type: LANDFILL

Point of Contact (Name/Phone): Marty Raymond

Date Entered (Day, Month, Year): 10/11/97

Media Evaluated (GW, SW, Sediment, Soil): GW SWH SWEM SEDH SEDEM SOIL

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): FS

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

National Priority List (Y/N): Yes **Site Rank:** High

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
The JILF covers approximately 25 acres of filled land. Prior to landfilling activities tidal flats with tidal drainage channels separated Jamaica Island from Seavey Island. From 1945 to 1978 this area was filled with general refuse, trash, construction rubble and various industrial wastes. In 1978 a 2-acre foot thick clay cap and clay barrier wall were constructed around a portion of the landfill that accepted dredge spoils. The JILF is now covered with topsoil, pavement or rock and used as recreational, parking and equipment laydown areas, respectively. Groundwater at JILF varies from brackish to fresh and is not used as a source of drinking water. The groundwater at the JILF varies spatially and seasonally from fresh to brackish to seawater-like.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
Groundwater: The groundwater of the island, specifically under JILF is impacted by the landfilled constituents. While the groundwater is not used or intended to be used for drinking water purposes and is separate from the mainland groundwater, there is communication of the groundwater with the estuarine river While no contamination exists which indicates the need for any prompt remedial action, seeps of groundwater are discharging contaminants to the Piscataqua River. Ongoing offshore studies will indicate the need for consideration of groundwater seeps. Soil: Possible occupational and recreational exposure if the surface soils are disturbed.

Brief Description of Receptors (Human and Ecological):
Human: Groundwater is not used on the Shipyard and there is no evidence to indicate that there is any additonal risk to human health from exposure to surface soils during recreational use of the area. Ecological: Groundwater seeps and contaminated sediments are making some impacts on the estuarine flora and fauna as some stress is thought to exist in mussels and eelgrass. Human and ecological receptors from past migration of contaminants include Piscataqua River biota and human consumption of seafood from the area.

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(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the (or RFA) phase that has not been entered into RMIS.

Ground Water

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Naphthalene	140.0	6.2	22.580
Aroclor-1254	13.0	0.73	17.810
Lead	49.2	4.0	12.300
Dichloroethane, 1,2- (EDC)	73.0	12.0	6.080
Arsenic (cancer endpoint)	14.8	4.5	3.290
Benz[a]anthracene	14.5	9.2	1.580
Benzo[b]fluoranthene	14.0	9.2	1.520
Chloroform	10.0	16.0	0.630
Ethylbenzene	530.0	1,300.0	0.410
Mercury and compounds (inorganic)	4.5	11.0	0.410
		Total:	67.910

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.

Confined - Information indicates that the potential for contaminant migration from the source is limited (due to geological structures or physical controls)

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Monitoring wells on-site and adjacent to the Piscataqua River indicate the presence of contamination.**

RECEPTOR FACTOR (RF)

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The GW (cont. or not) is a current drinking water source or is equiv. to (Class I or IIA aquifer).

Limited - There is no potentially threatened water supply well downgradient of the source. The groundwater is not considered a potential source of DW or is of limited benificial use (IIIA, IIIB or perched aquifer).

Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for DW, irrigation or agriculture, but not presently used (Class IIB aquifer).

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Groundwater flows into the Piscataqua River and contamination is available for uptake by biota.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00008 **Groundwater Category:** High
(High, Medium, Low)

Soil

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Copper and compounds	12,200.0	2,800.0	4.360
Lead	339.0	400.0	0.850
Arsenic (cancer endpoint)	14.2	21.0	0.680
Aroclor-1254	0.65	0.97	0.670
DDT	19.0	170.0	0.110
Cadmium and compounds	3.2	37.0	0.090
Benzo[a]pyrene	0.43	5.6	0.080
Zinc	1,250.0	22,000.0	0.060
Mercury and compounds (inorganic)	1.3	23.0	0.060
Benzo[b]fluoranthene	0.51	56.0	0.010
		Total:	**6.970**

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination is present at, is moving towards, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Low possibility for contamination to be present at or migrate to a point of exposure

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Surface soil samples indicate the presence of contamination. Exposure through contact, in - gestion or inhalation is possible.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to contaminated soil

Potential - Potential for receptors to have access to contaminated soil

Limited - Little or no potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Receptors include persons working or living on the shipyard.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00008 **Soil Category:** High
(High, Medium, Low)

Surface Water Human

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Nickel and compounds	0.05	730.0	
Lead		4.0	
		Total:	

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): X

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Confined - Information indicates a low potential for contamination to a potential point of exposure (could by due to the presence of geological structures or physical controls)

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Studies of the Piscataqua River media and biota indicate presence of contamination.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to surface water

Limited - Little or no potential for receptors to have access to surface water

Potential - Potential for receptors to have access to surface water

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Receptors include Piscataqua River plant and animal life and humans consuming seafood or c -** ontacting surface water and sediments.

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00008 **Surface Water Human Category:** High
(High, Medium, Low)

Surface Water Eco Marine

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Dieldrin	1.1		550.000
DDT	0.04		36.000
Mercury	0.7	0.03	28.000
Copper and compounds	30.8	2.9	10.620
Nickel and compounds	42.3	8.3	5.100
Zinc	413.0	86.0	4.800
Lead	36.5	8.5	4.290
Polychlorinated biphenyls	0.05	0.03	1.700
Mirex			0.250
Chromium VI and compounds	7.7	50.0	0.150
		Total:	**641.460**

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): X

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or physical controls)

(Place an "X" next to one below)

Evident: _____

Potential: X

Confined: _____

Brief Rationale for Selection: **Studies of the Piscataqua River media and biota indicate the presence of contamination.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to surface water

Potential - Potential for receptors to have access to surface water

Limited - Little or no potential for receptors to have access to surface water

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Receptors include Piscataqua River biota exposed to surface water.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00008 **Surface Water Marine Category:** High
(High, Medium, Low)

Sediment Human

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Arsenic (cancer endpoint)	28.7	21.0	1.370
Aluminum	77,900.0	75,000.0	1.040
Benzo[a]pyrene	2.2	5.6	0.390
Lead	124.0	400.0	0.310
Chromium (total)	211.0	3,000.0	0.070
Benz[a]anthracene	3.6	56.0	0.060
Nickel and compounds	91.2	1,500.0	0.060
Cadmium and compounds	2.0	37.0	0.050
Mercury and compounds (inorganic)	0.67	23.0	0.030
Zinc	530.0	22,000.0	0.020
		Total:	**3.450**

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Studies of the Piscataqua River media and biota indicate the presence of contamination.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Potential - Potential for receptors to have access to sediment

Limited - Little or no potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Recreational and occupational exposure.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00008 **Sediment Human Category:** High
(High, Medium, Low)

Sediment Eco Marine

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Chrysene	3.2	0.06	53.330
Pyrene	10.0	0.35	28.570
Fluoranthene	14.0	0.6	23.330
Benz[a]anthracene	3.6	0.23	15.650
Polychlorinated biphenyls (PCBs)	0.35	0.05	7.000
Benzo[a]pyrene	2.2	0.4	5.500
Mercury and compounds (inorganic)	0.67	0.15	4.470
Zinc	530.0	120.0	4.420
Lead	124.0	35.0	3.540
Nickel and compounds	91.2	30.0	3.040
		Total:	**150.120**

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): X

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Studies of the Piscataqua River indicate the presence of contamination in the sediment and -** biota.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Limited - Little or no potential for receptors to have access to sediment

Potential - Potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Receptors include Piscataqua River biota exposed to sediments.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00008 **Sediment Marine Category:** High
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Location (State): ~~NH~~ ME

Site (Name/RMIS ID) / Project for FUDS: SWMU 00009

RMIS Site Type: SURFACE DISPOSAL AREA

Point of Contact (Name/Phone): Marty Raymond

Date Entered (Day, Month, Year): 10/16/97

Media Evaluated (GW, SW, Sediment, Soil): SOIL

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): FS

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

National Priority List (Y/N): Yes **Site Rank:** Low

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
At 2 locations within the boundaries of SWMU 8, the Jamaica Island Landfill, mercury waste consisting of such materials as spent fluorescent bulbs, broken or discarded thermometers and thermostats, mercury switches, and mercury-contaminated rags, brooms, and dust pans used for cleanup of spills, was enclosed in steel drums and encased in large concrete blocks or pipes sealed at both ends with concrete. At the east location concrete blocks were found intact and therefore left in place and the concrete pipe was removed because the integrity of the concrete ends was questioned. At the west location no concrete blocks or pipes could be found despite three attempts. Sampling of excavated soil material and nearby monitoring wells at both locations indicated there have been no releases of mercury at either the west or east mercury burial sites.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
Groundwater: The groundwater is common to the groundwater of SWMU 8, the Jamaica Island Landfill. If releases occurred to the groundwater the contaminants would be contained within the groundwater beneath the mercury burial site and host Jamaica Island Landfill with some discharge occurring through the saltwater freshwater interface boundary between the island and the Piscataqua River. Soil: At the east location the soils consist of brown to grey silty clay with debris consisting of reinforcing rods, roots, gravel and concrete. At the west location the soils are primarily spent sandblast grit with some sandy clay and significant debris consisting of steel rod, gravel and concrete. At both location the soil is underlain by former tidal flat highly organic clay soil deposits.

Brief Description of Receptors (Human and Ecological):
Human: Unless exploratory excavations are conducted there would be no human receptors to any potential contaminants contained within the concrete blocks or pipes. The soils are not contaminated from the disposed material and furthermore there would be no exposure unless excavation is conducted.
Ecological: Since there is no indication of any releases to the surrounding soil there is no potential for release to the surrounding ecology.
At the east location the blocks are above the ground water piezometric level. At the west location there is a potential that the unkown location of the disposed concrete blocks could be physically located below the groundwater and thereby have the means to release contaminants to the groundwater. However, there is no indication of any releases in the nearby monitoring wells.

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(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the (or RFA) phase that has not been entered into RMIS.

Ground Water

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Mercury and compounds (inorganic)		11.0	
		Total:	

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): X

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Information indicates that the potential for contaminant migration from the source is limited (due to geological structures or physical controls)

(Place an "X" next to one below)

Evident: _____

Potential: _____

Confined: X

Brief Rationale for Selection: **Receptors include ocupational exposure if vaults are excavated and opened.**

RECEPTOR FACTOR (RF)

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The GW (cont. or not) is a current drinking water source or is equiv. to (Class I or IIA aquifer).

Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for DW, irrigation or agriculture, but not presently used (Class IIB aquifer).

Limited - There is no potentially threatened water supply well downgradient of the source. The groundwater is not considered a potential source of DW or is of limited benificial use (IIIA, IIIB or perched aquifer).

(Place an "X" next to one below)

Identified: _____

Potential: _____

Limited: X

Brief Rationale for Selection: **Mercury contamination is not being detected outside the mercury burial vaults.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00009 **Groundwater Category:** Low
(High, Medium, Low)

Soil

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Benzo[a]pyrene	12.0	5.6	2.140
Benzo[b]fluoranthene	14.0	56.0	0.250
Benz[a]anthracene	14.0	56.0	0.250
Benzo[k]fluoranthene	10.0	560.0	0.020
Chrysene	12.0	5,600.0	
		Total:	**2.660**

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination is present at, is moving towards, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Low possibility for contamination to be present at or migrate to a point of exposure

(Place an "X" next to one below)

Evident: _____

Potential: _____

Confined: X

Brief Rationale for Selection: **Receptors include occupational exposure if vaults are excavated and opened.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to contaminated soil

Potential - Potential for receptors to have access to contaminated soil

Limited - Little or no potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

Identified: _____

Potential: _____

Limited: X

Brief Rationale for Selection: **Receptors include occupational exposure if excavation occurred.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00009 **Soil Category:** Low
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Date Entered (Day, Month, Year): 2/19/99

Location (State): ~~NH~~ ME

Media Evaluated (GW, SW, Sediment, Soil): GW SEDH SEDEM SOIL

Site (Name/RMIS ID) / Project for FUDS: SWMU 00010

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): FS

RMIS Site Type: UNDERGROUND STORAGE TANK

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

Point of Contact (Name/Phone): Marty Raymond

National Priority List (Y/N): Yes **Site Rank:** High

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
An underground 9680-gallon steel storage tank located outside of Bldg. 238 used for holding waste battery acid resulting from battery rebuilding operations. The unit and battery operations have been closed. In 1984 an approximate 2-inch diameter hole was discovered in the bottom of the tank. The volume of the tank would vary according to rise and fall of the tidal changes of the adjacent river. The tank was taken out of service in 1984 and removed in 1986. The area has subsequently been covered with asphalt paving. Materials disposed: Sulfuric battery acid contaminated with lead. Dates of operation: 1974-1984.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
Groundwater: The leaking storage tank was reportedly located below the groundwater table. The tank is located within 20 feet of the edge of the shoreline of the river and the area is likely in direct communication with the tidal action of the river, the contaminants would have had direct access to the estuarine river. Soil: Soils surrounding the area loamy clay mixed with rocky debris.

Brief Description of Receptors (Human and Ecological):
Contaminants released from the tank to the river would be exposed to the seafood chain which would include: shellfish, finfish, lobster and other benthic organisms. Humans could become exposed through seafood consumption or occupational exposure to soils or groundwater during excavation work.

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(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the (or RFA) phase that has not been entered into RMIS.

Ground Water

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Manganese	2,050.0	110.0	18.640
Lead	65.4	4.0	16.350
Iron	52,400.0	11,000.0	4.760
Chromium VI and compounds	79.3	180.0	0.440
Vanadium	101.0	260.0	0.390
Nickel and compounds	201.0	730.0	0.280
Barium and compounds	276.0	2,600.0	0.110
Mercury and compounds (inorganic)	0.29	11.0	0.030
Zinc	129.0	11,000.0	0.010
Thallium	86.6		
		Total:	**41.000**

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Information indicates that the potential for contaminant migration from the source is limited (due to geological structures or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Metal contamination is present in the soil, potential to leach into the groundwater exists -**

RECEPTOR FACTOR (RF)

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The GW (cont. or not) is a current drinking water source or is equiv. to (Class I or IIA aquifer).

Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for DW, irrigation or agriculture, but not presently used (Class IIB aquifer).

Limited - There is no potentially threatened water supply well downgradient of the source. The groundwater is not considered a potential source of DW or is of limited benificial use (IIIA, IIIB or perched aquifer).

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Groundwater reaching the Piscataqua River would be available for uptake by the plant and a -** nimal life and humans consuming seafood.

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00010 **Groundwater Category:** High
(High, Medium, Low)

Soil

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Lead	172,000.0	400.0	430,000
Antimony and compounds	1,580.0	30.0	52.670
Mercury and compounds (inorganic)	30.0	23.0	1.300
Iron	24,100.0	22,000.0	1.100
Arsenic (cancer)	23.1	21.0	1.100
Vanadium	109.0	520.0	0.210
Barium and compounds	887.0	5,200.0	0.170
Copper and compounds	486.0	2,800.0	0.170
Manganese and compounds	328.0	3,100.0	0.110
Cadmium and compounds	3.9	37.0	0.110
		Total:	**487.120**

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): X

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination is present at, is moving towards, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Low possibility for contamination to be present at or migrate to a point of exposure

(Place an "X" next to one below)

Evident: _____

Potential: X

Confined: _____

Brief Rationale for Selection: **Soil samples indicate the presence of contamination. Site is currently covered with aspha - lt pavement.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to contaminated soil

Potential - Potential for receptors to have access to contaminated soil

Limited - Little or no potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

Identified: _____

Potential: X

Limited: _____

Brief Rationale for Selection: **Occupational exposure during work which could disturb the soils in the area.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00010 **Soil Category:** High
(High, Medium, Low)

Sediment Human

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Lead	124.0	400.0	0.310
Zinc	530.0	22,000.0	0.020
		Total:	0.330

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): X

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Studies of the Piscataqua River indicate the presence of contamination in the sediment and biota.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Limited - Little or no potential for receptors to have access to sediment

Potential - Potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Receptors include seafood consumption and recreational or occupational exposure to sediments.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00010 **Sediment Human Category:** High
(High, Medium, Low)

Sediment Eco Marine

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Zinc	530.0	120.0	4.420
Lead	124.0	35.0	3.540
		Total:	7.960

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): ____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): ____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: ____

Confined: ____

Brief Rationale for Selection: **Studies of the Piscataqua River indicate the presence of contaminants in the sediment and biota.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Potential - Potential for receptors to have access to sediment

Limited - Little or no potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential: ____

Limited: ____

Brief Rationale for Selection: **Receptors include Piscataqua River biota.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00010 **Sediment Marine Category:** High
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Date Entered (Day, Month, Year): 10/17/95

Location (State): ~~NH~~ ME

Media Evaluated (GW, SW, Sediment, Soil): GW SOIL

Site (Name/RMIS ID) / Project for FUDS: SWMU 00011

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): FS

RMIS Site Type: UNDERGROUND STORAGE TANK

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

Point of Contact (Name/Phone): Marty Raymond

National Priority List (Y/N): Yes **Site Rank:** High

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
Two 8,000-gallon underground steel tanks from railroad cars were buried side by side toward the eastern end of the Shipyard near SWMU 8, Jamaica Island Landfill. The tanks were used to temporarily store waste oils and solvents both potentially contaminated with various metals. In 1979 and again in 1986 the tanks were inspected for leaks and found to be sound. The inspection in 1979 was an actual exhumation and reburial and it was stated "no evidence of releases" at that time. The inspection in 1986 included a tightness test. The tanks were removed in 1989 and at that time the tanks appeared to be sound and neither showed signs of leakage or deterioration. Therefore, soil contamination is believed to have occurred by occasional spillage from over-filling.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
Groundwater: When the tanks were removed in 1989 inspection of the excavated area revealed that the groundwater table was approximately 6 feet from the surface and at the "spring line" or half way up the diameter of the removed tanks. Soil: The excavated area exhibited soils indicative of loamy soil which had been previously tansported to provide proper support as fine-grained material to surround the buried tanks. The walls of the excavated material were representative of heterogeneous material at other locations of the landfill consisting of clayey, silty sand containing random rock, gravel, construction debris, wire and other steel debris. The soil had the appearance and smell of a high content of petroleum contamination.

Brief Description of Receptors (Human and Ecological):
Human: The area is covered with concrete and/or asphalt pavement. Ecological: As a potential contributor of contaminants to the groundwater in the area and because it is speculated at this time that the groundwater flow eventually reaches the back bay, SWMU 11 has the potential to contribute contaminants to the flora and fauna of the back bay and the Piscataqua River.

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(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the (or RFA) phase that has not been entered into RMIS.

Ground Water

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Benzo[a]pyrene	4.8	0.92	5.220
Aroclor-1254	1.3	0.73	1.780
Aroclor-1242	0.78		0.780
Benz[a]anthracene	4.8	9.2	0.520
Benzene	4.8	39.0	0.120
Dichlorodifluoromethane	25.0	390.0	0.060
Toluene	21.0	720.0	0.030
Dichloroethane, 1,1-	14.0	810.0	0.020
Xylene (mixed)	14.0	1,400.0	0.010
Methylphenol, 4-		180.0	
		Total:	**8.540**

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.

Confined - Information indicates that the potential for contaminant migration from the source is limited (due to geological structures or physical controls)

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Monitoring wells on-site and down gradient indicate contamination has migrated away from t -** he site.

RECEPTOR FACTOR (RF)

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The GW (cont. or not) is a current drinking water source or is equiv. to (Class I or IIA aquifer).

Limited - There is no potentially threatened water supply well downgradient of the source. The groundwater is not considered a potential source of DW or is of limited benificial use (IIIA, IIIB or perched aquifer).

Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for DW, irrigation or agriculture, but not presently used (Class IIB aquifer)

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Groundwater flows toward the Piscataqua River and contamination would be available for upt -** ake by plants and animals.

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00011 **Groundwater Category:** High
(High, Medium, Low)

Soil

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Aroclor-1254	13.0	0.97	13.400
Lead	339.0	400.0	0.850
Benz[a]anthracene	10.0	56.0	0.180
		Total:	14.430

(1) Evaluate for human contaminants only .
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination is present at, is moving towards, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Low possibility for contamination to be present at or migrate to a point of exposure

(Place an "X" next to one below)

Evident: _____

Potential: X

Confined: _____

Brief Rationale for Selection: **Surface soils samples indicate contamination. Site is currently covered with pavement.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to contaminated soil

Potential - Potential for receptors to have access to contaminated soil

Limited - Little or no potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Receptors include occupational exposure to persons disturbing the soils.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00011 **Soil Category:** High
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Date Entered (Day, Month, Year): 10/16/97

Location (State): ~~NH~~ ME

Media Evaluated (GW, SW, Sediment, Soil): SOIL

Site (Name/RMIS ID) / Project for FUDS: SWMU 00021

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): FS

RMIS Site Type: UNDERGROUND STORAGE TANK

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

Point of Contact (Name/Phone): Marty Raymond

National Priority List (Y/N): Yes **Site Rank:** Low

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
A 695 gallon steel underground storage tank located adjacent to building 75. This tank was in use from 1974 to 1991 and received waste water from air filter cleaning, deburring machines and acid/alkaline metal cleaning. Removed in 1991 the tank had large holes in both ends. The tank contents were analyzed and determined to be non-hazardous. Four soil samples were taken prior to backfilling.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
Site is within an industrial area and currently covered with pavement.

Brief Description of Receptors (Human and Ecological):
Occupational exposure during work which could disrupt pavement.

(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt
A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the
(or RFA) phase that has not been entered into RMIS.

Soil

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Benzo[a]pyrene	22.0	5.6	3.930
Benz[a]anthracene	34.0	56.0	0.610
Benzo[b]fluoranthene	18.0	56.0	0.320
Benzo[k]fluoranthene	43.0	560.0	0.080
Chrysene	34.0	5,600.0	0.010
		Total:	4.940

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination is present at, is moving towards, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Low possibility for contamination to be present at or migrate to a point of exposure

(Place an "X" next to one below)

Evident: _____

Potential: _____

Confined: X

Brief Rationale for Selection: **Soil samples indicate the presence of contamination.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to contaminated soil

Potential - Potential for receptors to have access to contaminated soil

Limited - Little or no potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

Identified: _____

Potential: X

Limited: _____

Brief Rationale for Selection: **Occupational exposure during work which could disrupt pavement and soil.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00021 **Soil Category:** Low
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Date Entered (Day, Month, Year): 3/30/98

Location (State): ~~NH~~ ME

Media Evaluated (GW, SW, Sediment, Soil): SEDH SEDEM

Site (Name/RMIS ID) / Project for FUDS: SWMU 00026

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): FS

RMIS Site Type: ABOVE GROUND STORAGE TANK

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

Point of Contact (Name/Phone): Marty Raymond

National Priority List (Y/N): Yes **Site Rank:** Low

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
Portable oil/water tanks were staged at the submarine berths since the 1960s to receive liquids pumped from the submarine bilges. Oil/water wastes containing acid and alkaline cleaning solutions are then pumped into rail cars for proper disposal. Occasional overflows in the past resulted in wastes flow into the adjacent Piscataqua River, pavement prevented wastes from infiltrating into the soil.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
Wastes entering into the Piscataqua River would impact the plant and animal life and humans consuming seafood.

Brief Description of Receptors (Human and Ecological):
Plant and animal life within the Piscataqua River and humans consuming seafood caught from this area.

(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt
A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the
(or RFA) phase that has not been entered into RMIS.

Sediment Human

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Arsenic (cancer endpoint)	28.7	21.0	1.370
Aluminum	77,900.0	75,000.0	1.040
Benzo[a]pyrene	2.2	5.6	0.390
Lead	124.0	400.0	0.310
Mercury and compounds (methyl)	0.67	5.5	0.120
Chromium (total)	211.0	3,000.0	0.070
Benz[a]anthracene	3.6	56.0	0.060
Nickel and compounds	91.2	1,500.0	0.060
Cadmium and compounds	2.0	37.0	0.050
Zinc	530.0	22,000.0	0.020
		Total:	**3.540**

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

(Place an "X" next to one below)

Evident: _____

Potential: _____

Confined: X

Brief Rationale for Selection: **Studies of the Piscataqua River indicate the presence of contaminants in the sediment and -** biota.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Potential - Potential for receptors to have access to sediment

Limited - Little or no potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Occupational and recreational exposure to sediments as well as consumption of seafood.**

Activity Name: KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00026 **Sediment Human Category:** Low
(High, Medium, Low)

Sediment Eco Marine

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Lead	124.0	8.0	15.500
Nickel and compounds	91.2	8.0	11.400
Zinc	530.0	86.0	6.160
Phenanthrene	6.2	5.0	1.240
Fluoranthene	14.0	16.0	0.880
Cadmium and compounds	2.0	9.0	0.220
Aldrin	0.02	1.0	0.020
DDE	0.01	14.0	
Hexachlorobenzene	0.01		
Polychlorinated biphenyls (PCBs)	0.35		
		Total:	**35.420**

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

(Place an "X" next to one below)

Evident: _____

Potential: _____

Confined: X

Brief Rationale for Selection: **Studies of the Piscataqua River indicate the presence of contamanation in the sediment and -** biota.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Potential - Potential for receptors to have access to sediment

Limited - Little or no potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Piscataqua River biota exposed to the sediment.**

Activity Name: KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00026 **Sediment Marine Category:** Low
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Date Entered (Day, Month, Year): 4/14/95

Location (State): ~~NH~~ ME

Media Evaluated (GW, SW, Sediment, Soil): GW SOIL

Site (Name/RMIS ID) / Project for FUDS: SWMU 00027

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): FS

RMIS Site Type: POL (PETROLEUM/LUBRICANTS) LINES

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

Point of Contact (Name/Phone): Marty Raymond

National Priority List (Y/N): Yes **Site Rank:** High

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
Site was location of #6 oil pipeline from 1920s to 1978. In 1978 the pipeline ruptured and released oil into the soil. A section of the pipeline was removed in 1978 and the pieline was taken out of service. This site is adjacent to the Piscataqua River.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
Area is covered with asphalt pavement and contains many utility lines. Groundwater from site flows into Piscataqua River.

Brief Description of Receptors (Human and Ecological):
Groundwater is not currently a source for drinking water. However it can reach the Piscataqua River and impact aquatic life.

(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the (or RFA) phase that has not been entered into RMIS.

Ground Water

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Lead	4,500.0	4.0	1125.000
Dichloroethane, 1,2- (EDC)	24.0	12.0	2.000
Chromium (total)	139.0	180.0	0.770
Cadmium and compounds	11.0	18.0	0.610
Mercury and compounds (inorganic)	4.7	11.0	0.430
Trichloroethane, 1,1,2-	6.0	20.0	0.300
Beryllium and compounds	21.3	73.0	0.290
Cobalt	509.0	2,200.0	0.230
Nickel and compounds	27.0	730.0	0.040
		Total:	1129.670

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): X

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.

Confined - Information indicates that the potential for contaminant migration from the source is limited (due to geological structures or physical controls)

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Monitoring wells on-site and adjacent to the Piscataqua River indicate the presence of con - tamination.**

RECEPTOR FACTOR (RF)

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The GW (cont. or not) is a current drinking water source or is equiv. to (Class I or IIA aquifer).

Limited - There is no potentially threatened water supply well downgradient of the source. The groundwater is not considered a potential source of DW or is of limited benificial use (IIIA, IIIB or perched aquifer).

Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for DW, irrigation or agriculture, but not presently used (Class IIB aquifer).

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Contaminated groundwater could flow directly into the Piscataqua River and be available fo - r uptake by plant and animal life.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00027 **Groundwater Category:** High
(High, Medium, Low)

Soil

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Lead	632.5	400.0	1.580
Cadmium and compounds	5.9	37.0	0.160
Manganese and compounds	422.0	3,100.0	0.140
Copper and compounds	306.0	2,800.0	0.110
Zinc	1,510.0	22,000.0	0.070
Benzo[a]pyrene	0.23	5.6	0.040
Nickel and compounds	60.0	1,500.0	0.040
Mercury and compounds (inorganic)	0.51	23.0	0.020
Chromium (total)	66.4	3,000.0	0.020
Barium and compounds	93.8	5,200.0	0.020
		Total:	2.230

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination is present at, is moving towards, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Low possibility for contamination to be present at or migrate to a point of exposure

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Soil samples indicate presence of contamination.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to contaminated soil

Potential - Potential for receptors to have access to contaminated soil

Limited - Little or no potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

Identified: _____

Potential: X

Limited: _____

Brief Rationale for Selection: **Receptors include occupational exposure from excavations or utility work in the area.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00027 **Soil Category:** High
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Date Entered (Day, Month, Year): 2/19/99

Location (State): ~~NH~~ ME

Media Evaluated (GW, SW, Sediment, Soil): GW SOIL

Site (Name/RMIS ID) / Project for FUDS: SITE 00029

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): CERCLA RI/FS

RMIS Site Type: BURN AREA

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

Point of Contact (Name/Phone): Marty Raymond

National Priority List (Y/N): Yes **Site Rank:** High

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
Historical research shows site was previously used as a site for open pit and "teepee" incinerator burning of wastes. Ash and residues were removed and placed in SWMU 8. This area is on reclaimed land which aerial photographs indicate received Shipyard wastes. Filling occured while site was used for open burning of wastes.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
Exposure can occur through contact with soils. Site covered with buildings and pavement, some grassy areas remain. Migration to the river is possible via groundwater or erosion of soils.

Brief Description of Receptors (Human and Ecological):
Occupational exposure to personnel working on or near the site during operations which disrupt the soil. Groundwater at site may also be impacted and migrating to the Piscataqua River.

(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the (or RFA) phase that has not been entered into RMIS.

Ground Water

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Lead	49.2	4.0	12.300
Dichloroethane, 1,2- (EDC)	73.0	12.0	6.080
Arsenic (cancer)	14.8	4.5	3.290
Copper and compounds	1,400.0	1,400.0	1.000
Manganese and compounds	1,670.0	1,700.0	0.980
Antimony and compounds	12.2	15.0	0.810
Mercury	4.5	11.0	0.410
Cadmium and compounds	4.5	18.0	0.250
Selenium	42.8	180.0	0.240
Iron	1,840.0	11,000.0	0.170
		Total:	25.930

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Information indicates that the potential for contaminant migration from the source is limited (due to geological structures or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Monitoring wells on-site and adjacent to the Piscataqua River indicate the presence of con - tamination.**

RECEPTOR FACTOR (RF)

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The GW (cont. or not) is a current drinking water source or is equiv. to (Class I or IIA aquifer).

Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for DW, irrigation or agriculture, but not presently used (Class IIB aquifer).

Limited - There is no potentially threatened water supply well downgradient of the source. The groundwater is not considered a potential source of DW or is of limited benificial use (IIIA, IIIB or perched aquifer).

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Groundwater flows into the Piscataqua River and contamination is available for uptake by p - lants and animals.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SITE 00029 **Groundwater Category:** High
(High, Medium, Low)

Soil

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Lead	116,000.0	400.0	290.000
Antimony and compounds	5,720.0	30.0	190.670
Copper and compounds	47,800.0	2,800.0	17.070
Iron	258,000.0	22,000.0	11.730
2,3,7,8-TCDD (dioxin)			5.590
Arsenic (cancer)	38.0	21.0	1.810
Cadmium and compounds	51.0	37.0	1.380
Nickel and compounds	1,870.0	1,500.0	1.250
Manganese and compounds	3,180.0	3,100.0	1.030
Vanadium	250.0	520.0	0.480
		Total:	**523.680**

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): X

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination is present at, is moving towards, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Low possibility for contamination to be present at or migrate to a point of exposure

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Surface soils indicate contamination is present and have not been been isolated to minimiz -** e exposure to workers.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to contaminated soil

Potential - Potential for receptors to have access to contaminated soil

Limited - Little or no potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Workers in the area of the site may be exposed through inhalation or dermal contact.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SITE 00029 **Soil Category:** High
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Date Entered (Day, Month, Year): 2/18/99

Location (State): ~~NH~~ ME

Media Evaluated (GW, SW, Sediment, Soil): GW SOIL

Site (Name/RMIS ID) / Project for FUDS: SITE 00030

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): CERCLA PA

RMIS Site Type: PLATING SHOP

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

Point of Contact (Name/Phone): Marty Raymond

National Priority List (Y/N): Yes **Site Rank:** High

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
Building 184 is currently used as a welding school for navy employees. Previously the site was used for galvanizing and metal cleaning. A yellow powderery efflorescence has appeared at the joint between the wall and the floor at the location where an acid dip tank was located. This substance has a very low pH (2.3) and cadmium, chromium, barium and lead were found in TCLP tests of this powder.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
Primary pathway of concern is exposure to workers in building.

Brief Description of Receptors (Human and Ecological):
Occupational exposure.

(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the (or RFA) phase that has not been entered into RMIS.

Ground Water

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Lead	3.6	4.0	0.900
Manganese and compounds	1,100.0	1,700.0	0.650
Iron	2,120.0	11,000.0	0.190
Bis(2-ethylhexyl)phthalate (DEHP)	6.0	480.0	0.010
Phenol	0.9	22,000.0	
Butyl benzyl phthalate	0.9	7,300.0	
Zinc	11.0	11,000.0	
		Total:	1.750

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): X

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.

Confined - Information indicates that the potential for contaminant migration from the source is limited (due to geological structures or physical controls)

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

(Place an "X" next to one below)

Evident: _____

Potential: X

Confined: _____

Brief Rationale for Selection: **Potential for leaching to groundwater exists.**

RECEPTOR FACTOR (RF)

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The GW (cont. or not) is a current drinking water source or is equiv. to (Class I or IIA aquifer).

Limited - There is no potentially threatened water supply well downgradient of the source. The groundwater is not considered a potential source of DW or is of limited benificial use (IIIA, IIIB or perched aquifer).

Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for DW, irrigation or agriculture, but not presently used (Class IIB aquifer).

(Place an "X" next to one below)

Identified: _____

Potential: X

Limited: _____

Brief Rationale for Selection: **Water may eventually reach Piscataqua River.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SITE 00030 **Groundwater Category:** Low
(High, Medium, Low)

Soil

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Benzo[a]pyrene	24.0	5.6	4.290
Dibenz[ah]anthracene	7.6	5.6	1.360
Iron	27,800.0	22,000.0	1.260
Lead	394.0	400.0	0.990
Arsenic (cancer)	15.7	21.0	0.750
Benzo[b]fluoranthene	24.0	56.0	0.430
Benz(a)anthracene	20.0	56.0	0.360
Aluminum	19,900.0	75,000.0	0.270
Indeno[1,2,3-cd]pyrene	14.0	56.0	0.250
Manganese and compounds	717.0	3,100.0	0.230
		Total:	**10.480**

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination is present at, is moving towards, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Low possibility for contamination to be present at or migrate to a point of exposure

(Place an "X" next to one below)

Evident: _____

Potential: X

Confined: _____

Brief Rationale for Selection: **Direct occupational expesure to workers within Building 184 through inhalation or dermal c - ontact.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to contaminated soil

Potential - Potential for receptors to have access to contaminated soil

Limited - Little or no potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Direct occupational exposure to workers within Building 184.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SITE 00030 **Soil Category:** High
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Date Entered (Day, Month, Year): 2/19/99

Location (State): ~~NH~~ ME

Media Evaluated (GW, SW, Sediment, Soil): GW SOIL

Site (Name/RMIS ID) / Project for FUDS: SITE 00031

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): CERCLA PA

RMIS Site Type: LANDFILL

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

Point of Contact (Name/Phone): Marty Raymond

National Priority List (Y/N): Yes **Site Rank:** Low

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
Historical information indicates this site was used as a landfill during early part of this century. The site is currently covered by buildings and pavement. Direct exposure is unlikely except for excavation work.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
The site may impact the plant and animal life and humans consuming seafood in the vicinity of the site.

Brief Description of Receptors (Human and Ecological):
Human: Construction exposure to workers during excavation. Plant and animal life within the Piscataqua River and humans consuming seafood caught from this area.

(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the (or RFA) phase that has not been entered into RMIS.

Ground Water

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Arsenic (cancer)	48.6	4.5	10.800
Lead	35.7	4.0	8.930
Manganese and compounds	9,730.0	1,700.0	5.720
Iron	9,930.0	11,000.0	0.900
Aluminum	4,950.0	37,000.0	0.130
Barium and compounds	279.0	2,600.0	0.110
Mercury and compounds (inorganic)	0.45	11.0	0.040
Selenium	4.3	180.0	0.020
Butyl benzyl phthalate	11.0	7,300.0	
Thallium	48.6		
		Total:	**26.660**

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Information indicates that the potential for contaminant migration from the source is limited (due to geological structures or physical controls)

(Place an "X" next to one below)

Evident: _____

Potential: X

Confined: _____

Brief Rationale for Selection:

RECEPTOR FACTOR (RF)

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The GW (cont. or not) is a current drinking water source or is equiv. to (Class I or IIA aquifer).

Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for DW, irrigation or agriculture, but not presently used (Class IIB aquifer).

Limited - There is no potentially threatened water supply well downgradient of the source. The groundwater is not considered a potential source of DW or is of limited benificial use (IIIA, IIIB or perched aquifer).

(Place an "X" next to one below)

Identified: _____

Potential: _____

Limited: X

Brief Rationale for Selection:

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SITE 00031 **Groundwater Category:** Low
(High, Medium, Low)

Soil

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Lead	9,080.0	400.0	22.700
Iron	133,000.0	22,000.0	6.050
Mercury and compounds (inorganic)	109.0	23.0	4.740
Arsenic (cancer)	45.6	21.0	2.170
Benzo[a]pyrene	8.6	5.6	1.540
Copper and compounds	4,090.0	2,800.0	1.460
Manganese and compounds	1,150.0	3,100.0	0.370
Dibenz[ah]anthracene	1.6	5.6	0.290
Aluminum	22,100.0	75,000.0	0.290
Nickel and compounds	342.0	1,500.0	0.230
		Total:	40.820

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination is present at, is moving towards, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Low possibility for contamination to be present at or migrate to a point of exposure

(Place an "X" next to one below)

Evident: _____

Potential: _____

Confined: X

Brief Rationale for Selection: **Soil excavations and historical evidence indicate the West Timber Bas was used as a landfi - ll.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to contaminated soil

Potential - Potential for receptors to have access to contaminated soil

Limited - Little or no potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

Identified: _____

Potential: X

Limited: _____

Brief Rationale for Selection: **Receptor includes occupational exposure if excavation occured.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SITE 00031 **Soil Category:** Low
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Location (State): ~~NH~~ ME

Site (Name/RMIS ID) / Project for FUDS: SITE 00032

RMIS Site Type: LANDFILL

Point of Contact (Name/Phone): Marty Raymond

Date Entered (Day, Month, Year): 5/24/99

Media Evaluated (GW, SW, Sediment, Soil): GW SEDEM SOIL

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): CERCLA PA

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

National Priority List (Y/N): Yes **Site Rank:** High

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
Historical information this site had been used as a landfill and salvage area early in 1900s.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
Contact with soils and groundwater.

Brief Description of Receptors (Human and Ecological):
Occupational and residential exposure from Shipyard workers and family housing residents.

(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt
A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the
(or RFA) phase that has not been entered into RMIS.

Ground Water

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Lead	195.0	4.0	48.750
Manganese	1,070.0	110.0	9.730
Arsenic (cancer)	41.2	4.5	9.160
Iron	17,000.0	11,000.0	1.550
Copper and compounds	496.0	1,400.0	0.350
Nickel and compounds	128.0	730.0	0.180
Aluminum	2,770.0	37,000.0	0.070
Barium and compounds	128.0	2,600.0	0.050
Zinc	532.0	11,000.0	0.050
Mercury and compounds (inorganic)	0.46	11.0	0.040
		Total:	69.930

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Information indicates that the potential for contaminant migration from the source is limited (due to geological structures or physical controls)

(Place an "X" next to one below)

Evident: _____

Potential: X

Confined: _____

Brief Rationale for Selection:

RECEPTOR FACTOR (RF)

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The GW (cont. or not) is a current drinking water source or is equiv. to (Class I or IIA aquifer).

Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for DW, irrigation or agriculture, but not presently used (Class IIB aquifer).

Limited - There is no potentially threatened water supply well downgradient of the source. The groundwater is not considered a potential source of DW or is of limited benificial use (IIIA, IIIB or perched aquifer).

(Place an "X" next to one below)

Identified: _____

Potential: X

Limited: _____

Brief Rationale for Selection:

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SITE 00032 **Groundwater Category:** Med
(High, Medium, Low)

Soil

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Copper and compounds	30,600.0	2,800.0	10.930
Iron	234,000.0	22,000.0	10.640
Lead	2,720.0	400.0	6.800
Arsenic (cancer)	25.8	21.0	1.230
Nickel and compounds	1,540.0	1,500.0	1.030
Benzo[a]pyrene	5.7	5.6	1.020
Mercury and compounds (inorganic)	16.3	23.0	0.710
Antimony and compounds	18.0	30.0	0.600
Manganese and compounds	1,580.0	3,100.0	0.510
Zinc	9,630.0	22,000.0	0.440
		Total:	**36.010**

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination is present at, is moving towards, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Low possibility for contamination to be present at or migrate to a point of exposure

(Place an "X" next to one below)

Evident: _____

Potential: X

Confined: _____

Brief Rationale for Selection: **Exposure to contaminated soils.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to contaminated soil

Potential - Potential for receptors to have access to contaminated soil

Limited - Little or no potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

Identified: _____

Potential: X

Limited: _____

Brief Rationale for Selection: **Occupational and residential exposure to Shipyard workers and residents.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SITE 00032 **Soil Category:** Med
(High, Medium, Low)

Surface Water Eco Marine

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Copper and compounds	42.5	2.9	14.660
Nickel and compounds	41.85	8.3	5.040
Zinc	201.3	86.0	2.340
Lead	9.3	8.5	1.090
Polychlorinated biphenyls (PCBs)	0.01	0.03	0.350
Mirex			0.080
Heptachlor epoxide			
Anthracene			
Fluorene			
Manganese and compounds	40.0		
		Total:	23.560

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Offshore investigations have found contamination present in the media and biota.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to surface water

Potential - Potential for receptors to have access to surface water

Limited - Little or no potential for receptors to have access to surface water

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Receptors include Piscataqua River biota from direct uptake and food chain ingestion.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SITE 00032 **Surface Water Marine Category:** High
(High, Medium, Low)

Sediment Eco Marine

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
DDD,4,4-	1.06		1060.000
DDT	0.06		31.870
Mercury	2.97	0.15	19.830
Chrysene	1.1	0.06	18.330
Pyrene	4.22	0.35	12.060
Lead	344.0	35.0	9.830
Anthracene	0.81	0.09	9.540
Copper and compounds	566.0	70.0	8.090
DDE,4,4-	0.02		7.800
Fluorene	0.26	0.04	7.490
		Total:	1217.960

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): X

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Offshore investigations have found contamination present in the media and biota.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Potential - Potential for receptors to have access to sediment

Limited - Little or no potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Receptors include Piscataqua River biota from direct uptake and food chain ingestion.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SITE 00032 **Sediment Marine Category:** High
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Location (State): ~~NH~~ ME

Site (Name/RMIS ID) / Project for FUDS: SITE 00034

RMIS Site Type: OTHER

Point of Contact (Name/Phone):

Date Entered (Day, Month, Year): 5/24/99

Media Evaluated (GW, SW, Sediment, Soil): SEDH SEDEM SOIL

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage):

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): No

National Priority List (Y/N): No **Site Rank:** High

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
Building 62 was the former Oil Gasification Plant and former Blacksmith Shop. The building has also been used as a pesticide storage area.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
The site is located adjacent to the shoreline.

Brief Description of Receptors (Human and Ecological):
Human: Occupational and Construction exposures are likely at this time. Ecological: The site could effect the plant and animal life and humans consuming seafood.

(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt
A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the
(or RFA) phase that has not been entered into RMIS.

Soil

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Lead	5,450.0	400.0	13.630
Benzo[a]pyrene	51.0	5.6	9.110
Antimony and compounds	231.0	30.0	7.700
Dibenz[ah]anthracene	20.0	5.6	3.570
Iron	37,000.0	22,000.0	1.680
Benz(a)anthracene	85.0	56.0	1.520
Arsenic (cancer)	17.6	21.0	0.840
Benzo[b]fluoranthene	46.0	56.0	0.820
Indeno[1,2,3-cd]pyrene	38.0	56.0	0.680
Naphthalene	18.0	55.0	0.330
		Total:	41.180

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination is present at, is moving towards, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Low possibility for contamination to be present at or migrate to a point of exposure

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Analytical data indicates soil contamination may be migrating offshore.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to contaminated soil

Potential - Potential for receptors to have access to contaminated soil

Limited - Little or no potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Receptors identified have access to sediment which contamination may have moved to.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SITE 00034 **Soil Category:** High
(High, Medium, Low)

Sediment Human

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Benzo[a]pyrene	5.6	5.6	1.000
Dibenz[ah]anthracene	2.5	5.6	0.450
Lead	181.0	400.0	0.450
Arsenic (cancer)	8.0	21.0	0.380
Benz(a)anthracene	9.2	56.0	0.160
Indeno[1,2,3-cd]pyrene	7.2	56.0	0.130
Benzo[b]fluoranthene	7.1	56.0	0.130
Anthracene	1,700.0	14,000.0	0.120
Chlordane, alpha- (2)	16.0	160.0	0.100
Aluminum	5,900.0	75,000.0	0.080
		Total:	**3.120**

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Analytical data indicates soil contamination may be migrating offshore.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Potential - Potential for receptors to have access to sediment

Limited - Little or no potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Receptors identified have access to sediment which contamination may have moved to.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SITE 00034 **Sediment Human Category:** High
(High, Medium, Low)

Sediment Eco Marine

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Chrysene	10.0	0.06	166.670
Benz(a)anthracene	9.2	0.23	40.000
Fluorene	1.1	0.04	31.430
Phenanthrene	6.4	0.22	28.440
Anthracene	1.7	0.09	20.000
Benzo[a]pyrene	5.6	0.4	14.000
Fluoranthene	5.2	0.6	8.670
DDD,4,4-	0.01		8.400
Lead	181.0	35.0	5.170
DDT	0.01		4.200
		Total:	**331.450**

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): X

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Analytical data indicates soil contamination may be migrating offshore.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Potential - Potential for receptors to have access to sediment

Limited - Little or no potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Receptors identified have access to sediment which contamination may have moved to.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SITE 00034 **Sediment Marine Category:** High
(High, Medium, Low)

APPENDIX C

SCHEDULES

C.1 OU1 SCHEDULE (SITES 10 & 21)

C.2 OU2 SCHEDULE (SITES 6 & 29)

C.3 OU3 SCHEDULE (SITES 8, 9, & 11 SOURCE CONTROL)

C.4 OU4 SCHEDULE (OFFSHORE)

C.5 OU7 SCHEDULE (SITE 32)

C.6 OU8 SCHEDULE (SITE 31)

C.7 OU9 SCHEDULE (SITE 34)

C.8 SITE 30, GALVANIZING PLANT BUILDING 184, SCHEDULE

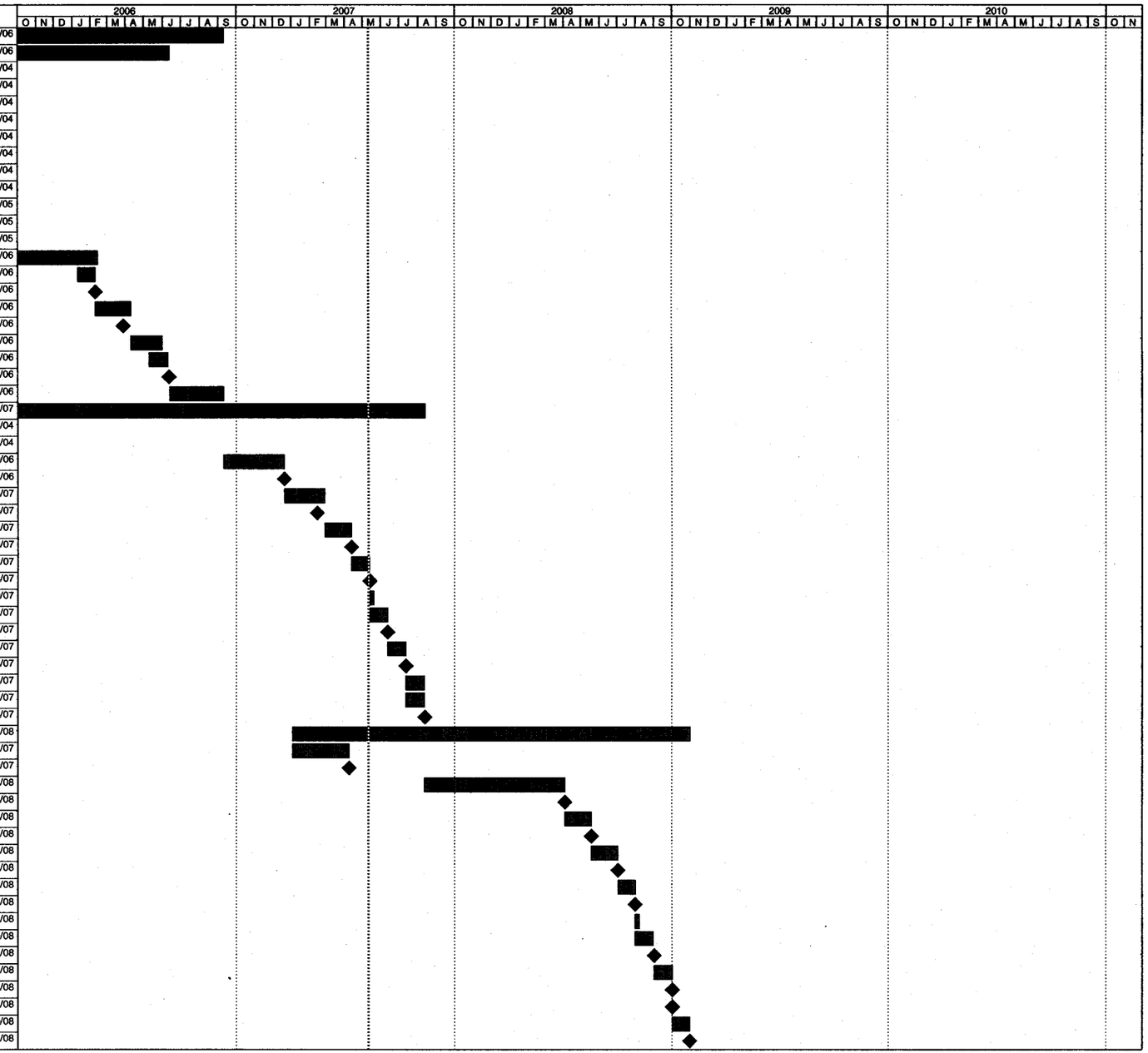
APPENDIX C.1

OU1 SCHEDULE (SITES 10 & 21)

Thu 5/10/07
12:05 PM

Portsmouth Naval Shipyard
Site Management Plan Schedules
OPERABLE UNIT 1 (OU1)

ID	Task Name	%	Dur	Start	Finish
112	SITE 10 DATA GAP INVESTIGATION	100%	938 d	Mon 2/16/04	Sun 9/10/06
113	WORKPLAN (QAPP)	100%	848 d	Mon 2/16/04	Mon 6/12/06
114	Prepare Draft QAPP	100%	74 d	Mon 2/16/04	Thu 4/29/04
119	USEPA, MEDEP & RAB Receives Draft QAPP	100%	1 d	Fri 4/30/04	Fri 4/30/04
120	USEPA, MEDEP & RAB Review Draft QAPP	100%	90 d	Fri 4/30/04	Wed 7/28/04
124	Navy Receives Comments on Draft QAPP	100%	31 d	Wed 6/16/04	Wed 7/28/04
125	Prepare draft QAPP Response to Comments Letter	100%	45 d	Wed 6/30/04	Fri 8/13/04
130	USEPA, MEDEP Receive draft QAPP Response to Comments Letter	100%	1 d	Mon 8/16/04	Mon 8/16/04
131	USEPA, MEDEP & RAB Reviews draft QAPP Response to Comments Letter	100%	30 d	Mon 8/16/04	Tue 9/14/04
135	Navy Receives Comments on draft QAPP Response to Comments Letter	100%	1 d	Wed 9/15/04	Wed 9/15/04
136	Navy and Regulator Comment Resolution	100%	179 d	Thu 9/16/04	Sun 3/13/05
137	USEPA, MEDEP Receive Responses to Follow-up Comments	100%	1 d	Mon 3/14/05	Mon 3/14/05
138	USEPA MEDEP & RAB Reviews Responses to Follow-up Comments	100%	80 d	Mon 3/14/05	Wed 6/1/05
139	Technical Meetings for resolution of groundwater concern (April 13, 2005 and February 13, 2006)	100%	307 d	Wed 4/13/05	Mon 2/13/06
140	Prepare revision pages for QAPP	100%	30 d	Wed 1/11/06	Thu 2/9/06
141	USEPA, MEDEP & RAB Receive Revision Pages for QAPP	100%	1 d	Fri 2/10/06	Fri 2/10/06
142	USEPA, MEDEP & RAB Review Revisions Pages for QAPP	100%	60 d	Fri 2/10/06	Mon 4/10/06
145	Navy Receives Approval, Comments, or Notice of Dispute	100%	13 d	Wed 3/29/06	Mon 4/10/06
146	Navy and Regulator Resolution or Notice of Dispute	100%	51 d	Tue 4/11/06	Wed 5/31/06
147	Prepare Final QAPP	100%	30 d	Thu 5/11/06	Fri 6/9/06
148	USEPA, MEDEP & RAB Receive Final QAPP	100%	1 d	Mon 6/12/06	Mon 6/12/06
149	FIELDWORK	100%	90 d	Tue 6/13/06	Sun 9/10/06
150	REMEDIAL INVESTIGATION REPORT (Primary Document)	70%	1314 d	Thu 1/8/04	Mon 8/13/07
151	Remedial Investigation Report Contracting Action	100%	25 d	Thu 1/8/04	Sun 2/1/04
159	Award SOW for Remedial Investigation Report	100%	1 d	Mon 2/2/04	Mon 2/2/04
160	Prepare Draft Remedial Investigation Report	100%	101 d	Mon 9/11/06	Wed 12/20/06
165	USEPA & MEDEP Receives Draft Remedial Investigation Report	100%	1 d	Thu 12/21/06	Thu 12/21/06
166	USEPA, MEDEP & RAB Review Draft Remedial Investigation Report	100%	68 d	Thu 12/21/06	Mon 2/26/07
170	Navy Recieves Comments on Draft Remedial Investigation Report	100%	13 d	Wed 2/14/07	Mon 2/26/07
171	Prepare Remedial Investigation Report Response to Comments Letter	100%	45 d	Tue 2/27/07	Thu 4/12/07
176	USEPA, MEDEP & RAB Receive Remedial Investigation Report Response to Comments Letter	100%	1 d	Fri 4/13/07	Fri 4/13/07
177	USEPA, MEDEP & RAB Reviews Remedial Investigation Report Response to Comments Letter	95%	30 d	Fri 4/13/07	Sat 5/12/07
181	Navy Receives Comments on Remedial Investigation Report Response to Comments Letter	0%	1 d	Mon 5/14/07	Mon 5/14/07
182	Navy and Regulator Comment Resolution	0%	7 d	Mon 5/14/07	Sun 5/20/07
183	Prepare Draft Final Remedial Investigation Report	0%	30 d	Mon 5/14/07	Tue 6/12/07
184	USEPA, MEDEP & RAB Receive Draft Final Remedial Investigation Report	0%	1 d	Wed 6/13/07	Wed 6/13/07
185	USEPA, MEDEP & RAB Review Draft Final Remedial Investigation Report	0%	30 d	Wed 6/13/07	Thu 7/12/07
189	Navy Receives Approval, Comments, or Notice of Dispute	0%	1 d	Fri 7/13/07	Fri 7/13/07
190	Navy and Regulator Resolution or Notice of Dispute	0%	30 d	Fri 7/13/07	Sat 8/11/07
191	Prepare Final Remedial Investigation Report	0%	30 d	Fri 7/13/07	Sat 8/11/07
192	USEPA, MEDEP & RAB Receive Final Remedial Investigation Report	0%	1 d	Mon 8/13/07	Mon 8/13/07
193	FEASIBILITY STUDY (Primary Document)	12%	667 d	Thu 1/4/07	Fri 10/31/08
194	FS, PRAP & ROD Contracting Action	100%	95 d	Thu 1/4/07	Sun 4/8/07
202	Award SOW for FS	100%	1 d	Mon 4/9/07	Mon 4/9/07
203	Prepare Draft FS Report	0%	236 d	Sun 8/12/07	Thu 4/3/08
209	USEPA & MEDEP Receives Draft FS Report	0%	1 d	Fri 4/4/08	Fri 4/4/08
210	USEPA, MEDEP & RAB Review Draft FS Report	0%	45 d	Fri 4/4/08	Sun 5/18/08
214	Navy Recieves Comments on Draft FS Report	0%	1 d	Mon 5/19/08	Mon 5/19/08
215	Prepare FS Report Response to Comments Letter	0%	45 d	Mon 5/19/08	Wed 7/2/08
220	USEPA, MEDEP & RAB Receive FS Report Response to Comments Letter	0%	1 d	Thu 7/3/08	Thu 7/3/08
221	USEPA, MEDEP & RAB Reviews FS Report Response to Comments Letter	0%	30 d	Thu 7/3/08	Fri 8/1/08
225	Navy Receives Comments on FS Report Response to Comments Letter	0%	1 d	Fri 8/1/08	Fri 8/1/08
226	Navy and Regulator Comment Resolution	0%	7 d	Fri 8/1/08	Thu 8/7/08
227	Prepare Draft Final FS Report	0%	30 d	Fri 8/1/08	Sat 8/30/08
228	USEPA, MEDEP & RAB Receive Draft Final FS Report	0%	1 d	Tue 9/2/08	Tue 9/2/08
229	USEPA, MEDEP & RAB Review Draft Final FS Report	0%	30 d	Tue 9/2/08	Wed 10/1/08
233	Navy Receives Approval, Comments, or Notice of Dispute	0%	1 d	Thu 10/2/08	Thu 10/2/08
234	Navy and Regulator Resolution or Notice of Dispute	0%	30 d	Thu 10/2/08	Fri 10/31/08
235	Prepare Final FS Report	0%	29 d	Thu 10/2/08	Thu 10/30/08
236	USEPA, MEDEP & RAB Receive Final FS Report	0%	1 d	Fri 10/31/08	Fri 10/31/08



Thu 5/10/07
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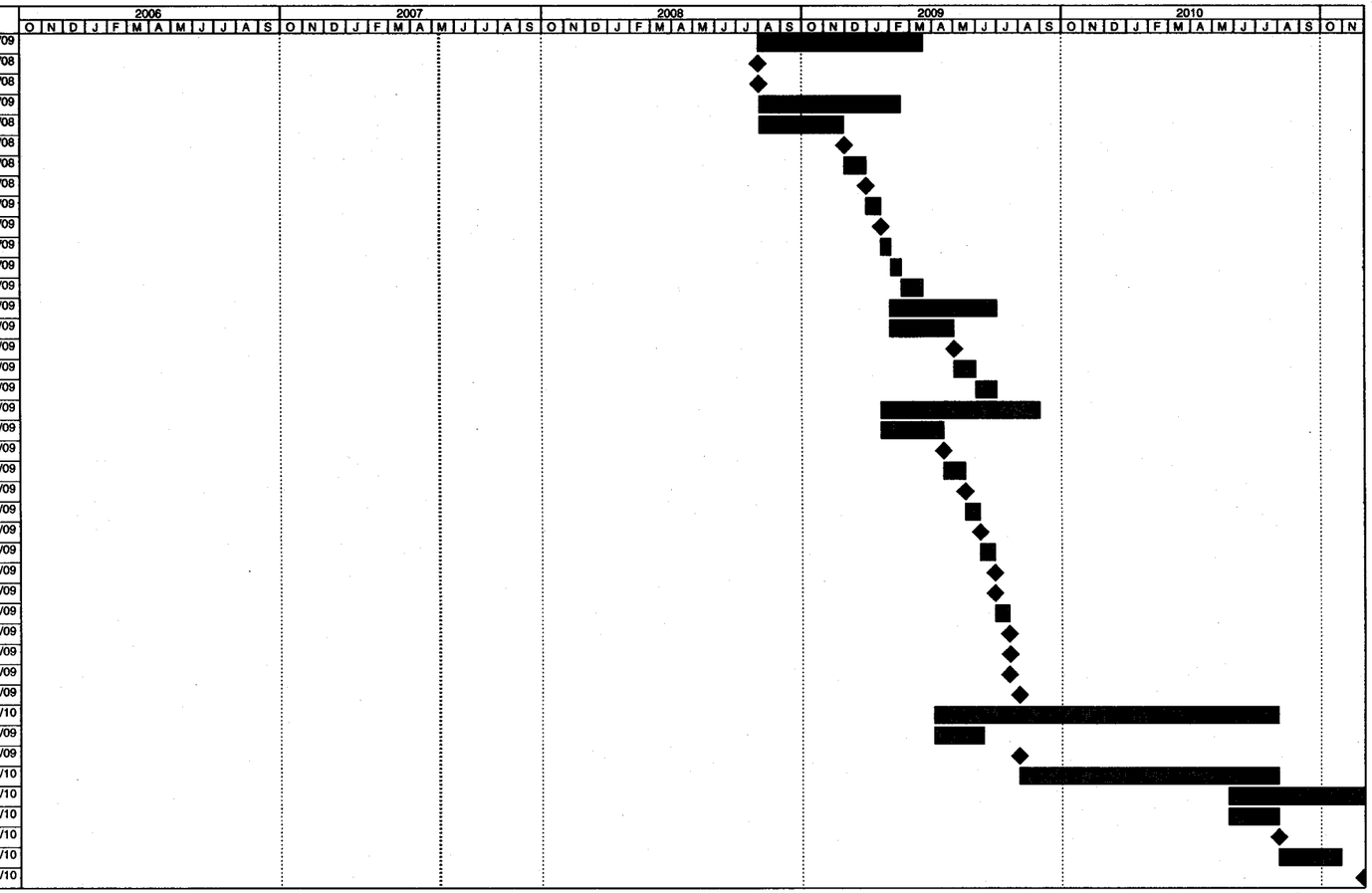
Portsmouth Naval Shipyard
Site Management Plan Schedules
OPERABLE UNIT 1 (OU1)

ID	Task Name	%	Dur	Start	Finish
237	PROPOSED REMEDIAL ACTION PLAN (PRAP)	0%	231 d	Fri 8/1/08	Thu 3/19/09
238	Authorize Release of Funds	0%	1 d	Fri 8/1/08	Fri 8/1/08
239	Award PRAP/ROD and RD/RA Schedule	0%	1 d	Sat 8/2/08	Sat 8/2/08
240	Prepare Proposed Remedial Action Plan	0%	198 d	Sun 8/3/08	Mon 2/16/09
241	Prepare Draft PRAP	0%	119 d	Sun 8/3/08	Sun 11/30/08
246	USEPA, MEDEP & RAB Receive Draft PRAP	0%	1 d	Mon 12/1/08	Mon 12/1/08
247	USEPA, MEDEP & RAB Review Draft PRAP Schedule	0%	30 d	Mon 12/1/08	Tue 12/30/08
251	Navy Receives Comments on Draft PRAP	0%	1 d	Wed 12/31/08	Wed 12/31/08
252	Prepare Response to Comments Letter & Draft Final PRAP	0%	21 d	Wed 12/31/08	Tue 1/20/09
253	USEPA, MEDEP & RAB Receive Draft Final PRAP & Response to Comments Letter	0%	1 d	Wed 1/21/09	Wed 1/21/09
254	Navy and Regulator Comment Resolution	0%	14 d	Wed 1/21/09	Tue 2/3/09
255	Prepare for Public Comment Period	0%	14 d	Wed 2/4/09	Tue 2/17/09
256	Public Comment Period	0%	30 d	Wed 2/18/09	Thu 3/19/09
257	PREPARATION OF RD/RA SCHEDULE AND REMEDIAL DESIGN	0%	150 d	Mon 2/2/09	Wed 7/1/09
258	Prepare RD/RA Schedule (Secondary)	0%	90 d	Mon 2/2/09	Sat 5/2/09
259	USEPA, MEDEP & RAB Receive RD Schedule	0%	1 d	Sun 5/3/09	Sun 5/3/09
260	Regulatory and RAB Review	0%	30 d	Sun 5/3/09	Mon 6/1/09
261	Decision/Resolution Period	0%	30 d	Tue 6/2/09	Wed 7/1/09
262	RECORD OF DECISION (ROD)	0%	223 d	Wed 1/21/09	Mon 8/31/09
263	Prepare Draft ROD (Primary Document)	0%	87 d	Wed 1/21/09	Fri 4/17/09
268	USEPA, MEDEP & RAB Receives Draft ROD	0%	1 d	Sat 4/18/09	Sat 4/18/09
269	USEPA, MEDEP & RAB Review Draft ROD	0%	30 d	Sat 4/18/09	Sun 5/17/09
273	Navy Receives Comments on Draft ROD	0%	1 d	Mon 5/18/09	Mon 5/18/09
274	Prepare Response to Comments Letter & Draft Final ROD	0%	21 d	Mon 5/18/09	Sun 6/7/09
279	USEPA, MEDEP & RAB Receive Response to Comments & Draft Final ROD	0%	1 d	Mon 6/8/09	Mon 6/8/09
280	USEPA, MEDEP & RAB Review Draft Final ROD	0%	21 d	Mon 6/8/09	Sun 6/28/09
284	Navy Receives Comments on Draft Final ROD	0%	1 d	Mon 6/29/09	Mon 6/29/09
285	MEDEP Submits Letter of Concurrence/Non-Concurrence	0%	1 d	Mon 6/29/09	Mon 6/29/09
286	Prepare Final ROD	0%	20 d	Mon 6/29/09	Sat 7/18/09
287	Navy Signs Final ROD	0%	1 d	Sun 7/19/09	Sun 7/19/09
288	USEPA Receives Final ROD	0%	1 d	Mon 7/20/09	Mon 7/20/09
289	USEPA Signs Final ROD	0%	14 d	Sun 7/19/09	Sat 8/1/09
290	Navy Distributes Final Record of Decision	0%	30 d	Sun 8/2/09	Mon 8/31/09
291	REMEDIAL DESIGN	0%	485 d	Sat 4/4/09	Sun 8/1/10
292	RD Contracting Action	0%	70 d	Sat 4/4/09	Fri 6/12/09
300	Award Remedial Design	0%	1 d	Sun 8/2/09	Sun 8/2/09
301	Design To Be Determined	0%	365 d	Sun 8/2/09	Sun 8/1/10
302	REMEDIAL ACTION	0%	191 d	Mon 5/24/10	Tue 11/30/10
303	RA Contracting Action	0%	70 d	Mon 5/24/10	Sun 8/1/10
311	Award Remedial Action	0%	1 d	Mon 8/2/10	Mon 8/2/10
312	Mobilization	0%	89 d	Mon 8/2/10	Fri 10/29/10
313	Start of Significant & Continuous Onsite Activity	0%	1 d	Tue 11/30/10	Tue 11/30/10



APPENDIX C.2

OU2 SCHEDULE (SITES 6 & 29)

Thu 5/10/07
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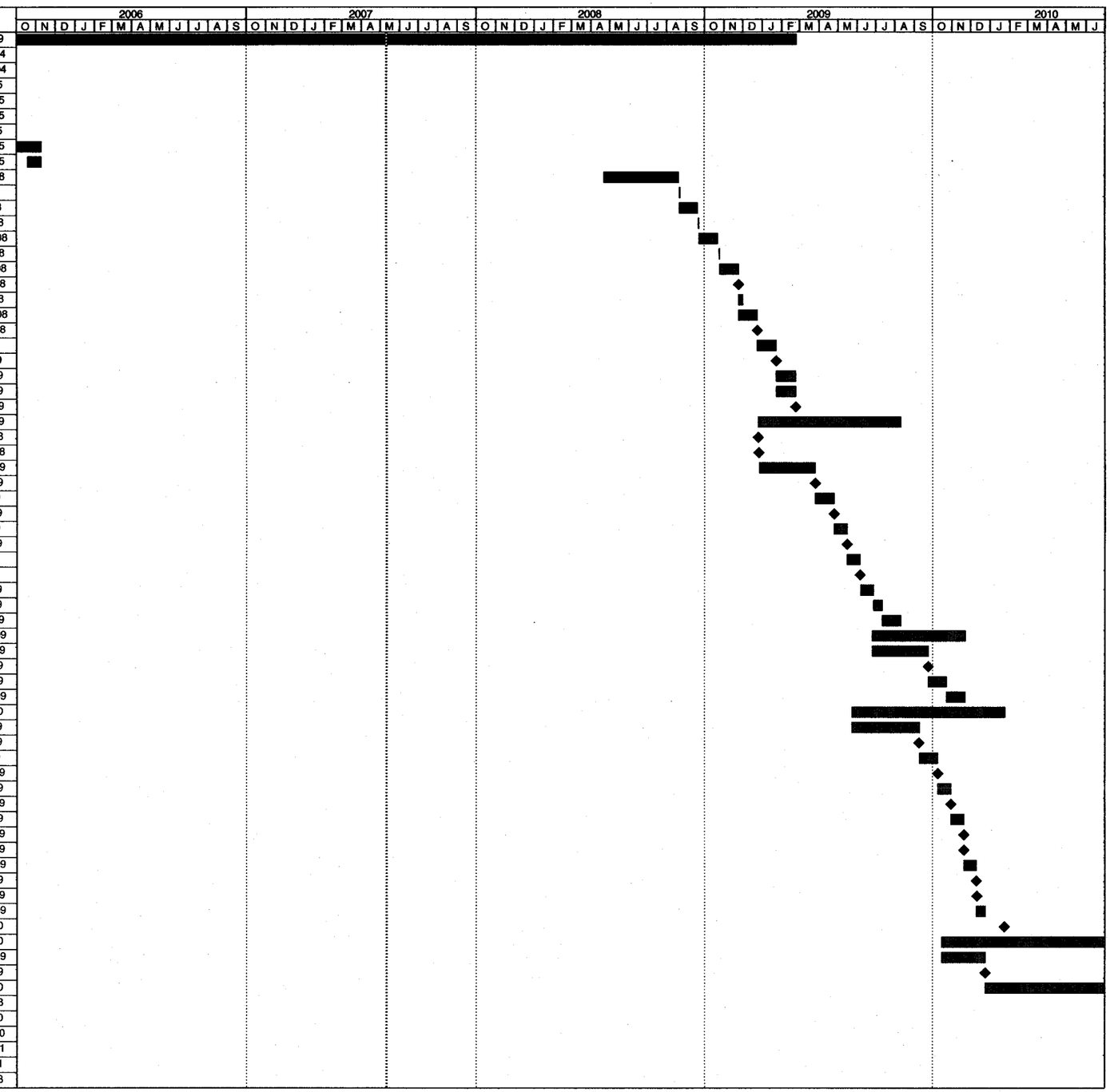
Portsmouth Naval Shipyard
Site Management Plan Schedule
OPERABLE UNIT 2 (OU2)

ID	Task Name	%	Dur	Start	Finish
117	FEASIBILITY STUDY (Primary Document)	71%	2187 d	Sat 3/1/03	Mon 2/23/09
118	Prepare Draft FS Report	100%	625 d	Sat 3/1/03	Sun 11/14/04
124	USEPA & MEDEP Receives Draft FS Report	100%	1 d	Mon 11/15/04	Mon 11/15/04
125	USEPA, MEDEP & RAB Review Draft FS Report	100%	135 d	Mon 11/15/04	Tue 3/29/05
129	Navy Receives Comments on Draft FS Report	100%	64 d	Wed 1/26/05	Wed 3/30/05
130	Prepare FS Report Response to Comments Letter	100%	113 d	Wed 3/30/05	Wed 7/20/05
138	USEPA, MEDEP & RAB Receive FS Report Response to Comments Letter	100%	1 d	Thu 7/21/05	Thu 7/21/05
139	USEPA, MEDEP & RAB Reviews FS Report Response to Comments Letter	100%	112 d	Thu 7/21/05	Wed 11/9/05
140	Navy Receives follow-up comments on FS Report Response to Comments Letter	100%	21 d	Thu 10/20/05	Wed 11/9/05
141	Prepare Revised Draft FS Report	0%	120 d	Wed 4/23/08	Wed 8/20/08
142	USEPA & MEDEP Receives Revised Draft FS Report	0%	1 d	Fri 8/22/08	Fri 8/22/08
143	USEPA, MEDEP & RAB Review Revised Draft FS Report	0%	30 d	Fri 8/22/08	Sat 9/20/08
147	Navy Receives Comments on Revised Draft FS Report	0%	1 d	Mon 9/22/08	Mon 9/22/08
148	Prepare FS Report Response to Comments Letter	0%	30 d	Tue 9/23/08	Wed 10/22/08
149	USEPA, MEDEP & RAB Receive FS Report Response to Comments Letter	0%	1 d	Sat 10/25/08	Sat 10/25/08
150	USEPA, MEDEP & RAB Reviews FS Report Response to Comments Letter	0%	30 d	Sun 10/26/08	Mon 11/24/08
154	Navy Receives Comments on FS Report Response to Comments Letter	0%	1 d	Tue 11/25/08	Tue 11/25/08
155	Navy and Regulator Comment Resolution	0%	7 d	Tue 11/25/08	Mon 12/1/08
156	Prepare Draft Final FS Report	0%	30 d	Tue 11/25/08	Wed 12/24/08
157	USEPA, MEDEP & RAB Receive Draft Final FS Report	0%	1 d	Thu 12/25/08	Thu 12/25/08
158	USEPA, MEDEP & RAB Review Draft Final FS Report	0%	30 d	Thu 12/25/08	Fri 1/23/09
162	Navy Receives Approval, Comments, or Notice of Dispute	0%	1 d	Sat 1/24/09	Sat 1/24/09
163	Navy and Regulator Resolution or Notice of Dispute	0%	30 d	Sat 1/24/09	Sun 2/22/09
164	Prepare Final FS Report	0%	30 d	Sat 1/24/09	Sun 2/22/09
165	USEPA, MEDEP & RAB Receive Final FS Report	0%	1 d	Mon 2/23/09	Mon 2/23/09
166	PROPOSED REMEDIAL ACTION PLAN (PRAP)	0%	228 d	Fri 12/26/08	Mon 8/10/09
167	Authorize Release of Funds	0%	1 d	Fri 12/26/08	Fri 12/26/08
168	Award PRAP/ROD and RD/RA Schedule	0%	1 d	Sat 12/27/08	Sat 12/27/08
169	Prepare Draft PRAP	0%	88 d	Sun 12/28/08	Wed 3/25/09
174	USEPA, MEDEP & RAB Receive Draft PRAP	0%	1 d	Thu 3/26/09	Thu 3/26/09
175	USEPA, MEDEP & RAB Review Draft PRAP	0%	30 d	Thu 3/26/09	Fri 4/24/09
179	Navy Receives Comments on Draft PRAP	0%	1 d	Sat 4/25/09	Sat 4/25/09
180	Prepare Response to Comments Letter & Draft Final PRAP	0%	21 d	Sat 4/25/09	Fri 5/15/09
181	USEPA, MEDEP & RAB Receive Draft Final PRAP & Response to Comments Letter	0%	1 d	Sat 5/16/09	Sat 5/16/09
182	USEPA, MEDEP & RAB Review Draft Final PRAP & Response to Comments Letter	0%	21 d	Sat 5/16/09	Fri 6/5/09
186	Navy Receives Comments on Draft Final PRAP	0%	1 d	Sat 6/6/09	Sat 6/6/09
187	Prepare Final PRAP	0%	21 d	Sun 6/7/09	Sat 6/27/09
188	Prepare for Public Comment Period	0%	14 d	Sun 6/28/09	Sat 7/11/09
189	Public Comment Period	0%	30 d	Sun 7/12/09	Mon 8/10/09
190	PREPARATION OF RD/RA SCHEDULE AND REMEDIAL DESIGN	0%	150 d	Fri 6/26/09	Sun 11/22/09
191	Prepare RD/RA Schedule (Secondary)	0%	90 d	Fri 6/26/09	Wed 9/23/09
192	USEPA, MEDEP & RAB Receive RD Schedule	0%	1 d	Thu 9/24/09	Thu 9/24/09
193	Regulatory and RAB Review	0%	30 d	Thu 9/24/09	Fri 10/23/09
194	Decision/Resolution Period	0%	30 d	Sat 10/24/09	Sun 11/22/09
195	RECORD OF DECISION (ROD)	0%	246 d	Sun 5/24/09	Sun 1/24/10
196	Prepare Draft ROD (Primary Document)	0%	109 d	Sun 5/24/09	Wed 9/9/09
204	USEPA, MEDEP & RAB Receives Draft ROD	0%	1 d	Wed 9/9/09	Wed 9/9/09
205	USEPA, MEDEP & RAB Review Draft ROD	0%	30 d	Thu 9/10/09	Fri 10/9/09
209	Navy Receives Comments on Draft ROD	0%	1 d	Sat 10/10/09	Sat 10/10/09
210	Prepare Response to Comments Letter & Draft Final ROD	0%	21 d	Sat 10/10/09	Fri 10/30/09
215	USEPA, MEDEP & RAB Receive Response to Comments & Draft Final ROD	0%	1 d	Sat 10/31/09	Sat 10/31/09
216	USEPA, MEDEP & RAB Review Draft Final ROD	0%	21 d	Sat 10/31/09	Fri 11/20/09
220	Navy Receives Comments on Draft Final ROD	0%	1 d	Sat 11/21/09	Sat 11/21/09
221	MEDEP Submits Letter of Concurrence/Non-Concurrence	0%	1 d	Sat 11/21/09	Sat 11/21/09
222	Prepare Final ROD	0%	20 d	Sat 11/21/09	Thu 12/10/09
223	Navy Signs Final ROD	0%	1 d	Fri 12/11/09	Fri 12/11/09
224	USEPA Receives Final ROD	0%	1 d	Sat 12/12/09	Sat 12/12/09
225	USEPA Signs Final ROD	0%	14 d	Fri 12/11/09	Thu 12/24/09
226	Navy Distributes Final Record of Decision	0%	1 d	Sun 1/24/10	Sun 1/24/10
227	REMEDIAL DESIGN	0%	435 d	Fri 10/16/09	Fri 12/24/10
228	RD Contracting Action	0%	70 d	Fri 10/16/09	Thu 12/24/09
236	Award Remedial Design	0%	1 d	Fri 12/25/09	Fri 12/25/09
237	Design To Be Determined	0%	365 d	Fri 12/25/09	Fri 12/24/10
238	REMEDIAL ACTION	0%	879 d	Sat 10/16/10	Tue 3/12/13
239	RA Contracting Action	0%	70 d	Sat 10/16/10	Fri 12/24/10
247	Award Remedial Action	0%	1 d	Sat 12/25/10	Sat 12/25/10
248	Mobilization	0%	89 d	Sat 12/25/10	Wed 3/23/11
249	Start of Significant & Continuous Onsite Activity	0%	1 d	Sun 3/13/11	Sun 3/13/11
250	Remedial Action Fieldwork	0%	730 d	Mon 3/14/11	Tue 3/12/13



Thu 5/10/07
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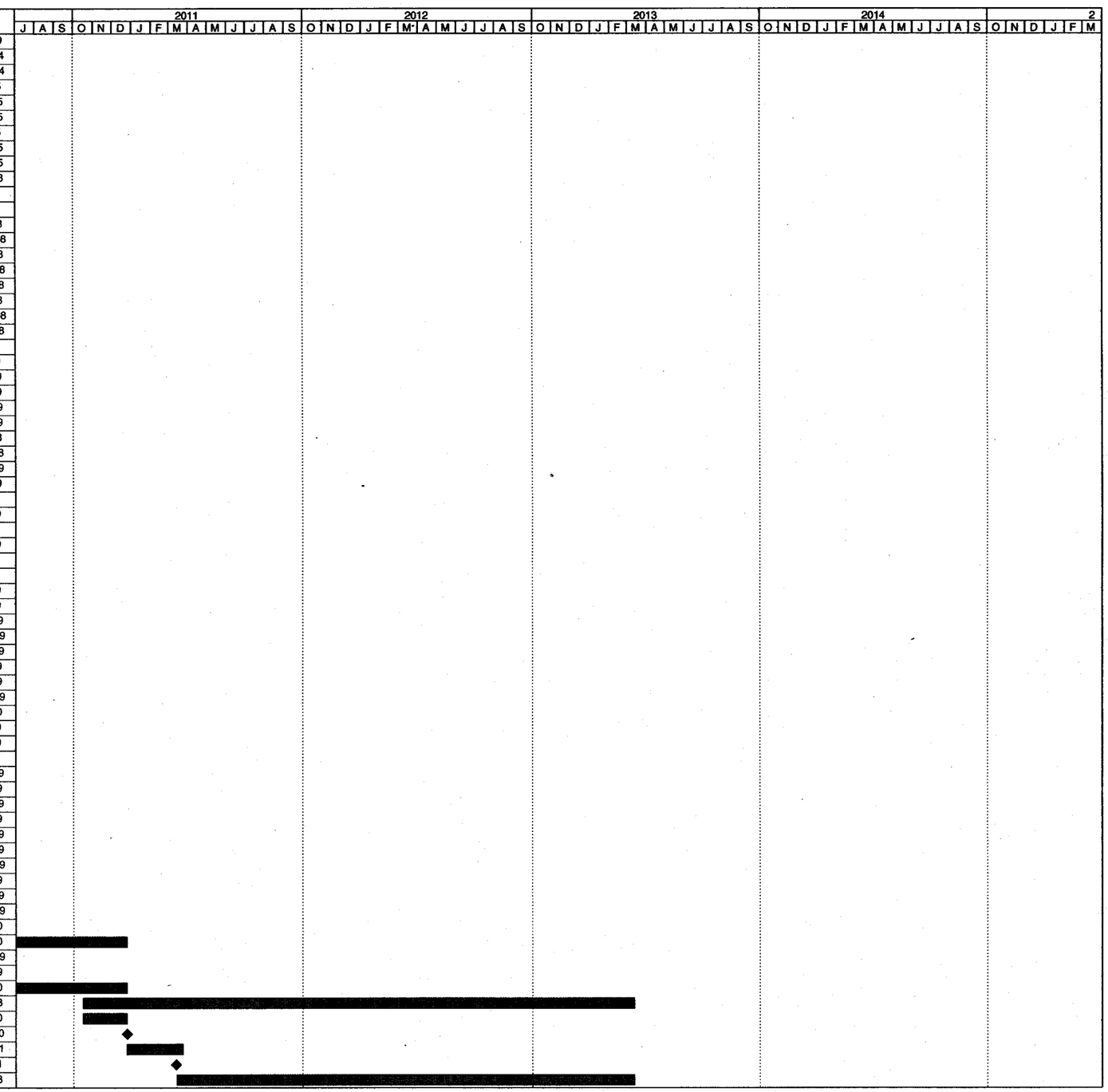
Portsmouth Naval Shipyard
Site Management Plan Schedule
OPERABLE UNIT 2 (OU2)

ID	Task Name	%	Dur	Start	Finish
117	FEASIBILITY STUDY (Primary Document)	71%	2187 d	Sat 3/1/03	Mon 2/23/09
118	Prepare Draft FS Report	100%	625 d	Sat 3/1/03	Sun 11/14/04
124	USEPA & MEDEP Receives Draft FS Report	100%	1 d	Mon 11/15/04	Mon 11/15/04
125	USEPA, MEDEP & RAB Review Draft FS Report	100%	135 d	Mon 11/15/04	Tue 3/29/05
129	Navy Receives Comments on Draft FS Report	100%	64 d	Wed 1/26/05	Wed 3/30/05
130	Prepare FS Report Response to Comments Letter	100%	113 d	Wed 3/30/05	Wed 7/20/05
138	USEPA, MEDEP & RAB Receive FS Report Response to Comments Letter	100%	1 d	Thu 7/21/05	Thu 7/21/05
139	USEPA, MEDEP & RAB Reviews FS Report Response to Comments Letter	100%	112 d	Thu 7/21/05	Wed 11/9/05
140	Navy Receives follow-up comments on FS Report Response to Comments Letter	100%	21 d	Thu 10/20/05	Wed 11/9/05
141	Prepare Revised Draft FS Report	0%	120 d	Wed 4/23/08	Wed 8/20/08
142	USEPA & MEDEP Receives Revised Draft FS Report	0%	1 d	Fri 8/22/08	Fri 8/22/08
143	USEPA, MEDEP & RAB Review Revised Draft FS Report	0%	30 d	Fri 8/22/08	Sat 9/20/08
147	Navy Receives Comments on Revised Draft FS Report	0%	1 d	Mon 9/22/08	Mon 9/22/08
148	Prepare FS Report Response to Comments Letter	0%	30 d	Tue 9/23/08	Wed 10/22/08
149	USEPA, MEDEP & RAB Receive FS Report Response to Comments Letter	0%	1 d	Sat 10/25/08	Sat 10/25/08
150	USEPA, MEDEP & RAB Reviews FS Report Response to Comments Letter	0%	30 d	Sun 10/26/08	Mon 11/24/08
154	Navy Receives Comments on FS Report Response to Comments Letter	0%	1 d	Tue 11/25/08	Tue 11/25/08
155	Navy and Regulator Comment Resolution	0%	7 d	Tue 11/25/08	Mon 12/1/08
156	Prepare Draft Final FS Report	0%	30 d	Tue 11/25/08	Wed 12/24/08
157	USEPA, MEDEP & RAB Receive Draft Final FS Report	0%	1 d	Thu 12/25/08	Thu 12/25/08
158	USEPA, MEDEP & RAB Review Draft Final FS Report	0%	30 d	Thu 12/25/08	Fri 1/23/09
162	Navy Receives Approval, Comments, or Notice of Dispute	0%	1 d	Sat 1/24/09	Sat 1/24/09
163	Navy and Regulator Resolution or Notice of Dispute	0%	30 d	Sat 1/24/09	Sun 2/22/09
164	Prepare Final FS Report	0%	30 d	Sat 1/24/09	Sun 2/22/09
165	USEPA, MEDEP & RAB Receive Final FS Report	0%	1 d	Mon 2/23/09	Mon 2/23/09
166	PROPOSED REMEDIAL ACTION PLAN (PRAP)	0%	228 d	Fri 12/26/08	Mon 8/10/09
167	Authorize Release of Funds	0%	1 d	Fri 12/26/08	Fri 12/26/08
168	Award PRAP/ROD and RD/RA Schedule	0%	1 d	Sat 12/27/08	Sat 12/27/08
169	Prepare Draft PRAP	0%	88 d	Sun 12/28/08	Wed 3/25/09
174	USEPA, MEDEP & RAB Receive Draft PRAP	0%	1 d	Thu 3/26/09	Thu 3/26/09
175	USEPA, MEDEP & RAB Review Draft PRAP	0%	30 d	Thu 3/26/09	Fri 4/24/09
179	Navy Receives Comments on Draft PRAP	0%	1 d	Sat 4/25/09	Sat 4/25/09
180	Prepare Response to Comments Letter & Draft Final PRAP	0%	21 d	Sat 4/25/09	Fri 5/15/09
181	USEPA, MEDEP & RAB Receive Draft Final PRAP & Response to Comments Letter	0%	1 d	Sat 5/16/09	Sat 5/16/09
182	USEPA, MEDEP & RAB Review Draft Final PRAP & Response to Comments Letter	0%	21 d	Sat 5/16/09	Fri 6/5/09
186	Navy Receives Comments on Draft Final PRAP	0%	1 d	Sat 6/6/09	Sat 6/6/09
187	Prepare Final PRAP	0%	21 d	Sun 6/7/09	Sat 6/27/09
188	Prepare for Public Comment Period	0%	14 d	Sun 6/28/09	Sat 7/11/09
189	Public Comment Period	0%	30 d	Sun 7/12/09	Mon 8/10/09
190	PREPARATION OF RD/RA SCHEDULE AND REMEDIAL DESIGN	0%	150 d	Fri 6/26/09	Sun 11/22/09
191	Prepare RD/RA Schedule (Secondary)	0%	90 d	Fri 6/26/09	Wed 9/23/09
192	USEPA, MEDEP & RAB Receive RD Schedule	0%	1 d	Thu 9/24/09	Thu 9/24/09
193	Regulatory and RAB Review	0%	30 d	Thu 9/24/09	Fri 10/23/09
194	Decision/Resolution Period	0%	30 d	Sat 10/24/09	Sun 11/22/09
195	RECORD OF DECISION (ROD)	0%	246 d	Sun 5/24/09	Sun 1/24/10
196	Prepare Draft ROD (Primary Document)	0%	109 d	Sun 5/24/09	Wed 9/9/09
204	USEPA, MEDEP & RAB Receives Draft ROD	0%	1 d	Wed 9/9/09	Wed 9/9/09
205	USEPA, MEDEP & RAB Review Draft ROD	0%	30 d	Thu 9/10/09	Fri 10/9/09
209	Navy Receives Comments on Draft ROD	0%	1 d	Sat 10/10/09	Sat 10/10/09
210	Prepare Response to Comments Letter & Draft Final ROD	0%	21 d	Sat 10/10/09	Fri 10/30/09
215	USEPA, MEDEP & RAB Receive Response to Comments & Draft Final ROD	0%	1 d	Sat 10/31/09	Sat 10/31/09
216	USEPA, MEDEP & RAB Review Draft Final ROD	0%	21 d	Sat 10/31/09	Fri 11/20/09
220	Navy Receives Comments on Draft Final ROD	0%	1 d	Sat 11/21/09	Sat 11/21/09
221	MEDEP Submits Letter of Concurrence/Non-Concurrence	0%	1 d	Sat 11/21/09	Sat 11/21/09
222	Prepare Final ROD	0%	20 d	Sat 11/21/09	Thu 12/10/09
223	Navy Signs Final ROD	0%	1 d	Fri 12/11/09	Fri 12/11/09
224	USEPA Receives Final ROD	0%	1 d	Sat 12/12/09	Sat 12/12/09
225	USEPA Signs Final ROD	0%	14 d	Fri 12/11/09	Thu 12/24/09
226	Navy Distributes Final Record of Decision	0%	1 d	Sun 1/24/10	Sun 1/24/10
227	REMEDIAL DESIGN	0%	435 d	Fri 10/16/09	Fri 12/24/10
228	RD Contracting Action	0%	70 d	Fri 10/16/09	Thu 12/24/09
236	Award Remedial Design	0%	1 d	Fri 12/25/09	Fri 12/25/09
237	Design To Be Determined	0%	365 d	Fri 12/25/09	Fri 12/24/10
238	REMEDIAL ACTION	0%	879 d	Sat 10/16/10	Tue 3/12/13
239	RA Contracting Action	0%	70 d	Sat 10/16/10	Fri 12/24/10
247	Award Remedial Action	0%	1 d	Sat 12/25/10	Sat 12/25/10
248	Mobilization	0%	89 d	Sat 12/25/10	Wed 3/23/11
249	Start of Significant & Continuous Onsite Activity	0%	1 d	Sun 3/13/11	Sun 3/13/11
250	Remedial Action Fieldwork	0%	730 d	Mon 3/14/11	Tue 3/12/13



Thu 5/10/07
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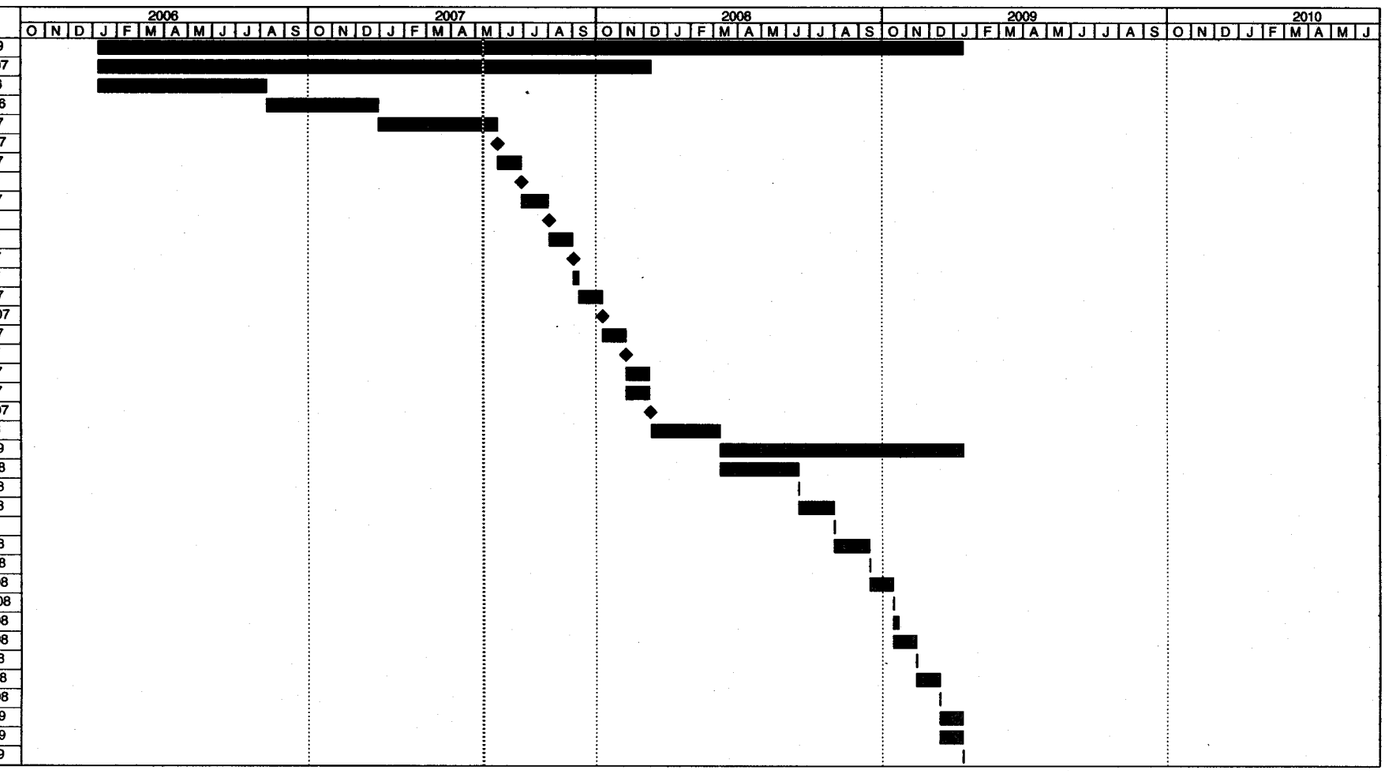
Portsmouth Naval Shipyard
Site Management Plan Schedule
OPERABLE UNIT 2 (OU2)

ID	Task Name	%	Dur	Start	Finish
251	SUPPLEMENTAL Supplemental RI (RI)	31%	1101 d	Mon 1/9/06	Tue 1/13/09
252	SUPPLEMENTAL RI QAPP (WORKPLAN)	54%	701 d	Mon 1/9/06	Mon 12/10/07
253	Prepare DQOs	100%	213 d	Mon 1/9/06	Wed 8/9/06
257	Discuss DQOs with regulators	100%	143 d	Thu 8/10/06	Sat 12/30/06
258	Prepare Draft QAPP	97%	150 d	Sun 12/31/06	Tue 5/29/07
263	USEPA, MEDEP & RAB Receives Draft QAPP	0%	1 d	Wed 5/30/07	Wed 5/30/07
264	USEPA, MEDEP & RAB Review Draft QAPP	0%	30 d	Wed 5/30/07	Thu 6/28/07
268	Navy Receives Comments on Draft QAPP	0%	1 d	Fri 6/29/07	Fri 6/29/07
269	Prepare draft QAPP Response to Comments Letter	0%	34 d	Fri 6/29/07	Wed 8/1/07
274	USEPA, MEDEP Receive draft QAPP Response to Comments Letter	0%	1 d	Fri 8/3/07	Fri 8/3/07
275	USEPA, MEDEP & RAB Reviews draft QAPP Response to Comments Letter	0%	30 d	Fri 8/3/07	Sat 9/1/07
279	Navy Receives Comments on draft QAPP Response to Comments Letter	0%	1 d	Mon 9/3/07	Mon 9/3/07
280	Navy and Regulator Comment Resolution	0%	7 d	Mon 9/3/07	Sun 9/9/07
281	Prepare Draft Final QAPP	0%	30 d	Mon 9/10/07	Tue 10/9/07
282	USEPA, MEDEP & RAB Receive Draft Final QAPP	0%	1 d	Wed 10/10/07	Wed 10/10/07
283	USEPA, MEDEP & RAB Review Draft Final QAPP	0%	30 d	Wed 10/10/07	Thu 11/8/07
287	Navy Receives Approval, Comments, or Notice of Dispute	0%	1 d	Fri 11/9/07	Fri 11/9/07
288	Navy and Regulator Resolution or Notice of Dispute	0%	30 d	Fri 11/9/07	Sat 12/8/07
289	Prepare Final QAPP	0%	30 d	Fri 11/9/07	Sat 12/8/07
290	USEPA, MEDEP & RAB Receive Final QAPP	0%	1 d	Mon 12/10/07	Mon 12/10/07
291	FIELDWORK	0%	90 d	Tue 12/11/07	Sun 3/9/08
292	SUPPLEMENTAL RI REPORT (Primary Document)	0%	310 d	Mon 3/10/08	Tue 1/13/09
293	Prepare Draft Supplemental RI Report	0%	99 d	Mon 3/10/08	Mon 6/16/08
298	USEPA & MEDEP Receives Draft Supplemental RI Report	0%	1 d	Tue 6/17/08	Tue 6/17/08
299	USEPA, MEDEP & RAB Review Draft Supplemental RI Report	0%	45 d	Tue 6/17/08	Thu 7/31/08
303	Navy Recieves Comments on Draft Supplemental RI Report	0%	1 d	Fri 8/1/08	Fri 8/1/08
304	Prepare Supplemental RI Report Response to Comments Letter	0%	45 d	Fri 8/1/08	Sun 9/14/08
309	USEPA, MEDEP & RAB Receive Supplemental RI Report Response to Comments Let	0%	1 d	Mon 9/15/08	Mon 9/15/08
310	USEPA, MEDEP & RAB Reviews Supplemental RI Report Response to Comments Let	0%	30 d	Mon 9/15/08	Tue 10/14/08
314	Navy Receives Comments on Supplemental RI Report Response to Comments Letter	0%	1 d	Wed 10/15/08	Wed 10/15/08
315	Navy and Regulator Comment Resolution	0%	7 d	Wed 10/15/08	Tue 10/21/08
316	Prepare Draft Final Supplemental RI Report	0%	30 d	Wed 10/15/08	Thu 11/13/08
317	USEPA, MEDEP & RAB Receive Draft Final Supplemental RI Report	0%	1 d	Fri 11/14/08	Fri 11/14/08
318	USEPA, MEDEP & RAB Review Draft Final Supplemental RI Report	0%	30 d	Fri 11/14/08	Sat 12/13/08
322	Navy Receives Approval, Comments, or Notice of Dispute	0%	1 d	Sun 12/14/08	Sun 12/14/08
323	Navy and Regulator Resolution or Notice of Dispute	0%	30 d	Sun 12/14/08	Mon 1/12/09
324	Prepare Final Supplemental RI Report	0%	30 d	Sun 12/14/08	Mon 1/12/09
325	USEPA, MEDEP & RAB Receive Final Supplemental RI Report	0%	1 d	Tue 1/13/09	Tue 1/13/09



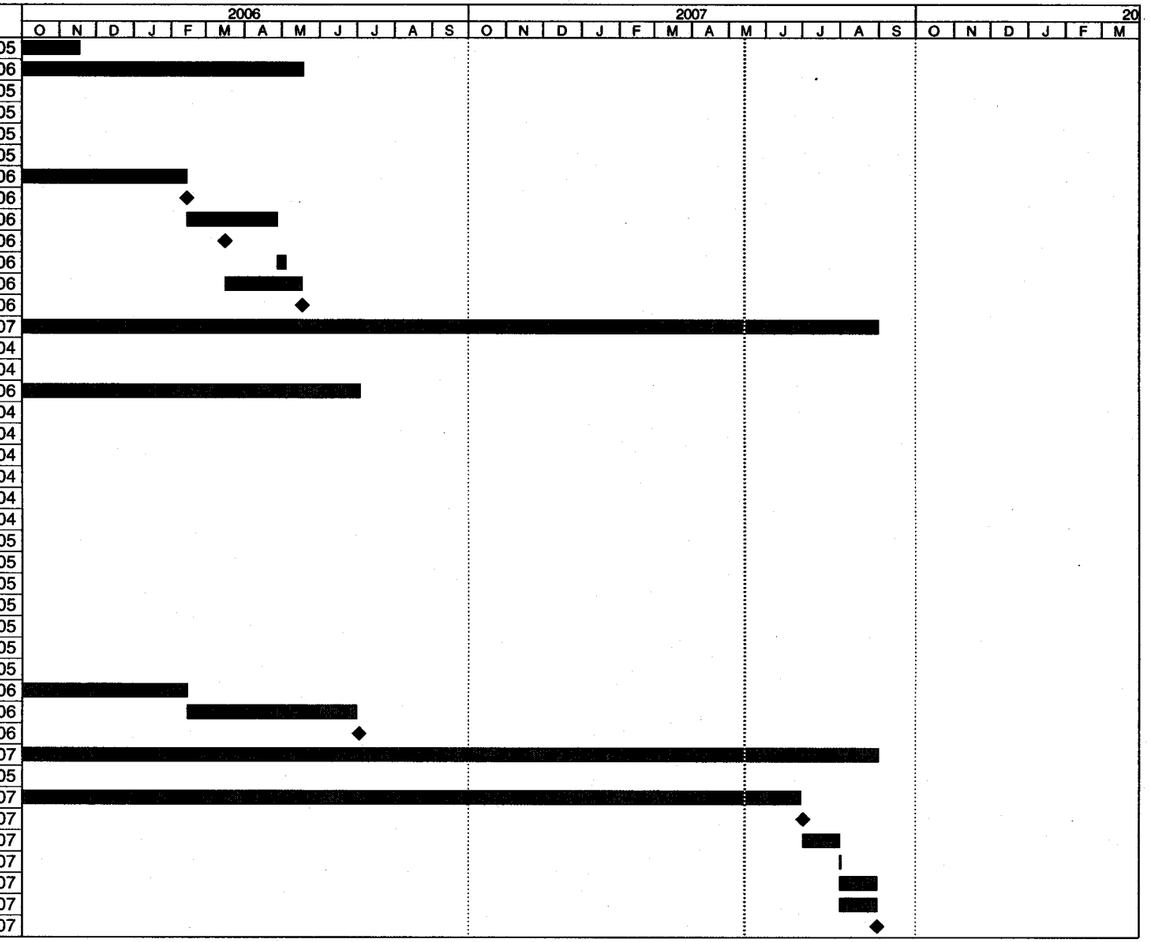
APPENDIX C.3

OU3 SCHEDULE (SITES 8, 9, & 11 SOURCE CONTROL)

Mon 5/14/07
2:15 PM

Portsmouth Naval Shipyard
Site Management Plan Schedule
OPERABLE UNIT 3 (OU3)

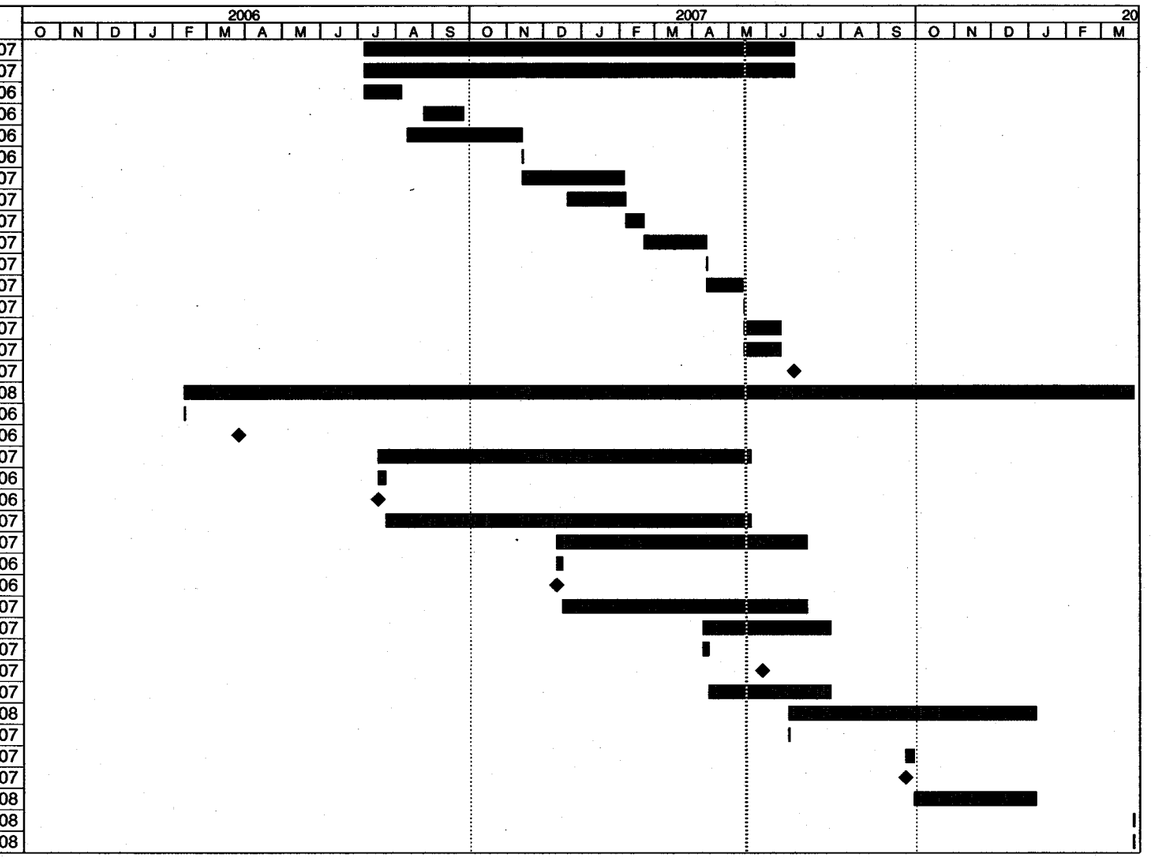
ID	Task Name	%	Dur	Start	Finish
355	EXPLANATION OF SIGNIFICANT DIFFERENCES (ESD) (Primary Document)	100%	200 d	Mon 5/2/05	Thu 11/17/05
373	REMEDIAL ACTION REPORT	100%	522 d	Mon 12/13/04	Thu 5/18/06
374	Prepare Draft Report	100%	145 d	Mon 12/13/04	Fri 5/6/05
375	USEPA, MEDEP & RAB Receive Draft Report	100%	1 d	Mon 5/9/05	Mon 5/9/05
376	USEPA, MEDEP, & RAB Review Draft Report	100%	66 d	Mon 5/9/05	Wed 7/13/05
380	Navy Receives Comments on Draft Report	100%	1 d	Thu 7/14/05	Thu 7/14/05
381	Prepare Responses to Comments on Draft Report	100%	215 d	Thu 7/14/05	Mon 2/13/06
382	USEPA, MEDEP & RAB Receive Responses to Comments on Draft Report	100%	1 d	Tue 2/14/06	Tue 2/14/06
383	Regulatory & RAB Review Responses to Comments	100%	73 d	Tue 2/14/06	Thu 4/27/06
384	Navy Receives Comments on Response to Comments Letter	100%	43 d	Fri 3/17/06	Fri 4/28/06
385	Navy and Regulator Comment Resolution	100%	7 d	Fri 4/28/06	Thu 5/4/06
386	Prepare Final Report	100%	62 d	Fri 3/17/06	Wed 5/17/06
387	Submit Final Report	100%	1 d	Thu 5/18/06	Thu 5/18/06
388	OPERATION, MAINTENANCE AND MONITORING PLAN (OM&M Plan)	90%	1314 d	Mon 1/26/04	Fri 8/31/07
389	OM&M Plan Contracting Action	100%	25 d	Mon 1/26/04	Thu 2/19/04
390	Notice of Award, OM&M Plan	100%	1 d	Fri 2/20/04	Fri 2/20/04
391	Prepare OM&M Plan	100%	865 d	Fri 2/20/04	Mon 7/3/06
392	Prepare Draft OM&M Plan	100%	165 d	Fri 2/20/04	Mon 8/2/04
393	USEPA, MEDEP & RAB Receives Draft OM&M Plan	100%	1 d	Tue 8/3/04	Tue 8/3/04
394	USEPA, MEDEP & RAB Review Draft OM&M Plan	100%	85 d	Tue 8/3/04	Tue 10/26/04
395	Navy Receives Comments on Draft OM&M Plan	100%	1 d	Wed 10/27/04	Wed 10/27/04
396	Prepare OM&M Plan Response to Comments Letter	100%	45 d	Wed 10/27/04	Fri 12/10/04
397	USEPA, MEDEP & RAB Receive OM&M Plan Response to Comments Letter	100%	1 d	Mon 12/13/04	Mon 12/13/04
398	USEPA, MEDEP & RAB Reviews OM&M Plan Response to Comments Letter	100%	50 d	Mon 12/13/04	Mon 1/31/05
399	Navy Receives Comments on OM&M Plan Response to Comments Letter	100%	2 d	Tue 2/1/05	Wed 2/2/05
400	Navy and Regulator Comment Resolution	100%	7 d	Tue 2/1/05	Mon 2/7/05
401	Prepare Draft Final OM&M Plan	100%	30 d	Tue 2/1/05	Wed 3/2/05
402	USEPA, MEDEP & RAB Receive Draft Final OM&M Plan	100%	1 d	Thu 3/3/05	Thu 3/3/05
403	USEPA, MEDEP & RAB Review Draft Final OM&M Plan	100%	112 d	Thu 3/3/05	Wed 6/22/05
404	Navy Receives Approval, Comments, or Notice of Dispute	100%	1 d	Thu 6/23/05	Thu 6/23/05
405	Navy and Regulator Resolution or Notice of Dispute	100%	236 d	Thu 6/23/05	Mon 2/13/06
406	Prepare Final OM&M Plan	100%	137 d	Tue 2/14/06	Fri 6/30/06
407	USEPA, MEDEP & RAB Receive Final OM&M Plan	100%	1 d	Mon 7/3/06	Mon 7/3/06
408	Prepare LUC (Appendix E of OM&M Plan)	80%	821 d	Thu 6/2/05	Fri 8/31/07
409	Navy Receive Comments on draft LUC	100%	22 d	Thu 6/2/05	Thu 6/23/05
410	Prepare Response to Comments Letter and DF LUC	90%	736 d	Fri 6/24/05	Fri 6/29/07
411	USEPA, MEDEP, & RAB Receive Response to Comments and DF LUC	0%	1 d	Mon 7/2/07	Mon 7/2/07
412	USEPA, MEDEP, & RAB Reviews Response to Comments and DF LUC	0%	30 d	Mon 7/2/07	Tue 7/31/07
413	Navy Receives Approval, Comments, or Notice of Dispute	0%	1 d	Wed 8/1/07	Wed 8/1/07
414	Navy and Regulator Resolution or Notice of Dispute	0%	30 d	Wed 8/1/07	Thu 8/30/07
415	Prepare Final LUC	0%	30 d	Wed 8/1/07	Thu 8/30/07
416	USEPA, MEDEP & RAB Receive Final LUC	0%	1 d	Fri 8/31/07	Fri 8/31/07



Mon 5/14/07
2:15 PM

Portsmouth Naval Shipyard
Site Management Plan Schedule
OPERABLE UNIT 3 (OU3)

ID	Task Name	%	Dur	Start	Finish
417	Five-Year Reviews	88%	353 d	Fri 7/7/06	Sun 6/24/07
418	First Five-Year Review	88%	353 d	Fri 7/7/06	Sun 6/24/07
419	Prepare for Site Inspection	100%	30 d	Fri 7/7/06	Sat 8/5/06
422	Conduct Site Inspection	100%	33 d	Fri 8/25/06	Tue 9/26/06
423	Prepare Draft Five-Year Review Report	100%	95 d	Fri 8/11/06	Mon 11/13/06
427	USEPA, MEDEP, & RAB Receive Draft Report	100%	1 d	Tue 11/14/06	Tue 11/14/06
428	USEPA, MEDEP, & RAB Review Draft Report	100%	83 d	Tue 11/14/06	Sun 2/4/07
431	Navy Receives Comments on Draft Report	100%	47 d	Thu 12/21/06	Mon 2/5/07
432	Comment resolution	100%	15 d	Tue 2/6/07	Tue 2/20/07
433	Prepare Responses to Comments on Draft Report and Draft Final Report	100%	51 d	Wed 2/21/07	Thu 4/12/07
434	USEPA, MEDEP & RAB Receive Responses to Comments and Draft Final Report	100%	1 d	Fri 4/13/07	Fri 4/13/07
435	USEPA, MEDEP, & RAB Review Responses to Comments and Draft Final Report	90%	30 d	Fri 4/13/07	Sat 5/12/07
438	Navy Receives Approval, Comments, or Notice of Dispute	0%	1 d	Mon 5/14/07	Mon 5/14/07
439	Navy and Regulator Resolution or Notice of Dispute	0%	30 d	Mon 5/14/07	Tue 6/12/07
440	Prepare Final Report	0%	30 d	Mon 5/14/07	Tue 6/12/07
441	Submit Final First Five-Year Review (5 years after start of on-site action)	0%	1 d	Sun 6/24/07	Sun 6/24/07
442	OPERATION, MAINTENANCE AND MONITORING PLAN IMPLEMENTATION	63%	777 d?	Fri 2/10/06	Thu 3/27/08
443	Submit draft sampling SOPs	100%	1 d	Fri 2/10/06	Fri 2/10/06
444	Conduct Tidal Study	100%	5 d	Mon 3/27/06	Fri 3/31/06
445	Conduct First Round	99%	306 d	Mon 7/17/06	Fri 5/18/07
446	Conduct groundwater and gas sampling	100%	6 d	Mon 7/17/06	Sat 7/22/06
447	Conduct routine inspection	100%	6 d	Mon 7/17/06	Sat 7/22/06
448	Prepare and submit data package	99%	300 d	Sun 7/23/06	Fri 5/18/07
454	Conduct Second Round	74%	205 d	Mon 12/11/06	Tue 7/3/07
455	Conduct groundwater and gas sampling	100%	5 d	Mon 12/11/06	Fri 12/15/06
456	Conduct routine inspection	100%	5 d	Mon 12/11/06	Fri 12/15/06
457	Prepare and submit data package	73%	200 d	Sat 12/16/06	Tue 7/3/07
461	Conduct Third Round	5%	105 d	Mon 4/9/07	Sun 7/22/07
462	Conduct groundwater and gas sampling	100%	5 d	Mon 4/9/07	Fri 4/13/07
463	Conduct routine inspection	0%	5 d	Mon 5/28/07	Fri 6/1/07
464	Prepare and submit data package	0%	100 d	Sat 4/14/07	Sun 7/22/07
468	Conduct Fourth Round	0%	202 d	Tue 6/19/07	Sun 1/6/08
469	Submit draft sampling SOPs	0%	1 d	Tue 6/19/07	Tue 6/19/07
470	Conduct groundwater and gas sampling	0%	7 d	Sat 9/22/07	Fri 9/28/07
471	Conduct routine inspection	0%	7 d	Sat 9/22/07	Fri 9/28/07
472	Prepare and submit data package	0%	100 d	Sat 9/29/07	Sun 1/6/08
476	Rounds 1 through 4 data evaluation report	0%	1 d?	Thu 3/27/08	Thu 3/27/08
477	Submit draft report	0%	1 d?	Thu 3/27/08	Thu 3/27/08



APPENDIX C.4
OU4 SCHEDULE (OFFSHORE)

Thu 5/10/07
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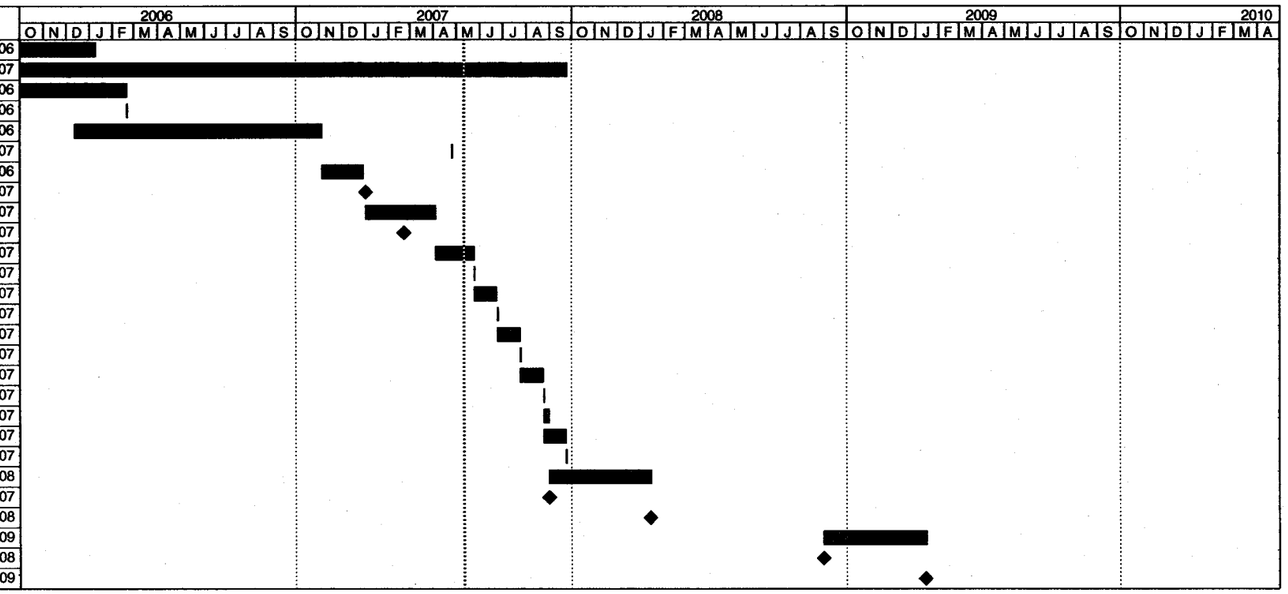
Portsmouth Naval Shipyard
Site Management Plan Schedule
OPERABLE UNIT 4 (OU4)

ID	Task Name	%	Dur	Start	Finish
167	Round 8 Interim Monitoring Samping Event	100%	143 d	Sat 8/20/05	Mon 1/9/06
175	ADDITIONAL SCRUTINY REPORT (AS Report)	76%	721 d	Tue 10/4/05	Mon 9/24/07
176	Prepare AS Data Package	100%	140 d	Tue 10/4/05	Mon 2/20/06
181	USEPA, MEDEP & RAB Receive AS Data Package	100%	1 d	Tue 2/21/06	Tue 2/21/06
182	Prepare Draft Conclusions and Recommendations for AS Report	100%	327 d	Tue 12/13/05	Sat 11/4/06
189	Discuss Conclusions and Recommendations with Regulators	100%	1 d	Thu 4/26/07	Thu 4/26/07
190	Prepare Draft AS Report	100%	55 d	Sun 11/5/06	Fri 12/29/06
191	USEPA, MEDEP & RAB Receive Draft AS Report	100%	1 d	Tue 1/2/07	Tue 1/2/07
192	USEPA, MEDEP & RAB Review Draft AS Report	100%	93 d	Tue 1/2/07	Wed 4/4/07
196	Navy Receives Comments on Draft AS Report	100%	43 d	Thu 2/22/07	Thu 4/5/07
197	Prepare AS Report Response to Comments	90%	50 d	Thu 4/5/07	Thu 5/24/07
198	USEPA, MEDEP & RAB Receive AS Report Response to Comments	0%	1 d	Fri 5/25/07	Fri 5/25/07
199	USEPA, MEDEP & RAB Reviews AS Report Response to Comments	0%	30 d	Fri 5/25/07	Sat 6/23/07
203	Navy Receives Comments on AS Report Response to Comments	0%	1 d	Mon 6/25/07	Mon 6/25/07
204	Prepare Response to Comments and Draft Final AS Report	0%	30 d	Mon 6/25/07	Tue 7/24/07
205	USEPA, MEDEP & RAB Receive Response to Comments and Draft Final AS Report	0%	1 d	Wed 7/25/07	Wed 7/25/07
206	USEPA, MEDEP & RAB Review Response to Comments and Draft Final AS Report	0%	30 d	Wed 7/25/07	Thu 8/23/07
210	Navy Receives Comments on Draft Final AS Report	0%	1 d	Sat 8/25/07	Sat 8/25/07
211	Navy and Regulatory Comment Resolution	0%	7 d	Sat 8/25/07	Fri 8/31/07
212	Prepare Response to Comments and Final AS Report	0%	30 d	Sat 8/25/07	Sun 9/23/07
213	USEPA, MEDEP & RAB Receive Final AS Report	0%	1 d	Mon 9/24/07	Mon 9/24/07
214	Round 9 Interim Monitoring Samping Event	0%	137 d?	Sat 9/1/07	Tue 1/15/08
215	Start of Round 9 Sampling Event	0%	1 d?	Sat 9/1/07	Sat 9/1/07
216	Submit Round 9 Data Package	0%	1 d?	Tue 1/15/08	Tue 1/15/08
217	Round 10 Interim Monitoring Samping Event	0%	137 d?	Mon 9/1/08	Thu 1/15/09
218	Start of Round 10 Sampling Event	0%	1 d?	Mon 9/1/08	Mon 9/1/08
219	Submit Round 10 Data Package	0%	1 d?	Thu 1/15/09	Thu 1/15/09



Thu 5/10/07
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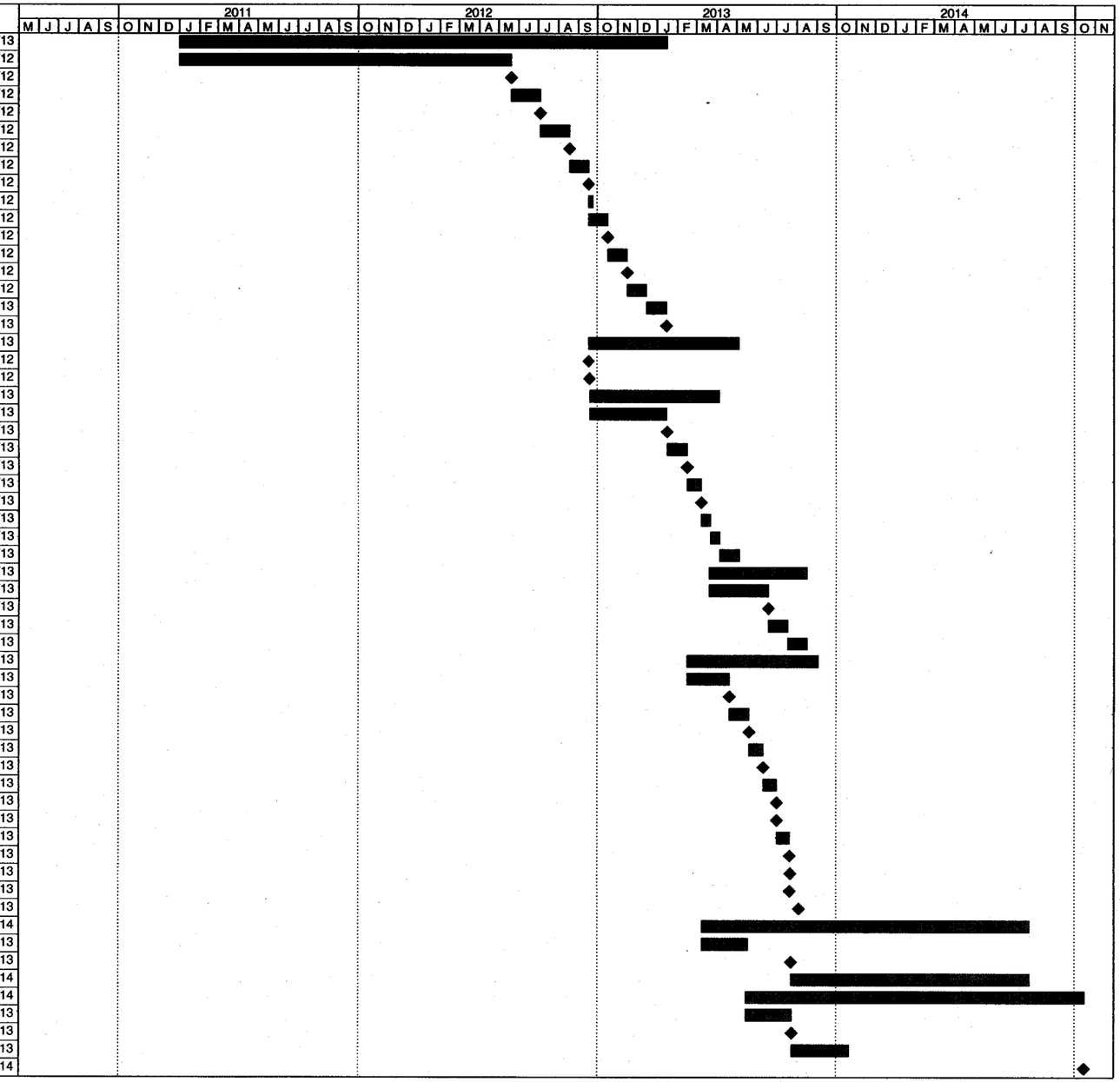
Portsmouth Naval Shipyard
Site Management Plan Schedule
OPERABLE UNIT 4 (OU4)

ID	Task Name	%	Dur	Start	Finish
220	OFFSHORE FEASIBILITY STUDY (FS)	0%	746 d	Sun 1/2/11	Wed 1/16/13
221	Prepare Draft FS Report	0%	505 d	Sun 1/2/11	Sun 5/20/12
227	USEPA & MEDEP Receives Draft FS Report	0%	1 d	Mon 5/21/12	Mon 5/21/12
228	USEPA, MEDEP & RAB Review Draft FS Report	0%	45 d	Mon 5/21/12	Wed 7/4/12
232	Navy Receives Comments on Draft FS Report	0%	1 d	Thu 7/5/12	Thu 7/5/12
233	Prepare FS Report Response to Comments Letter	0%	45 d	Thu 7/5/12	Sat 8/18/12
238	USEPA, MEDEP & RAB Receive FS Report Response to Comments Letter	0%	1 d	Sun 8/19/12	Sun 8/19/12
239	USEPA, MEDEP & RAB Reviews FS Report Response to Comments Letter	0%	30 d	Sun 8/19/12	Mon 9/17/12
243	Navy Receives Comments on FS Report Response to Comments Letter	0%	1 d	Tue 9/18/12	Tue 9/18/12
244	Navy and Regulator Comment Resolution	0%	7 d	Tue 9/18/12	Mon 9/24/12
245	Prepare Draft Final FS Report	0%	30 d	Tue 9/18/12	Wed 10/17/12
246	USEPA, MEDEP & RAB Receive Draft Final FS Report	0%	1 d	Thu 10/18/12	Thu 10/18/12
247	USEPA, MEDEP & RAB Review Draft Final FS Report	0%	30 d	Thu 10/18/12	Fri 11/16/12
251	Navy Receives Approval, Comments, or Notice of Dispute	0%	1 d	Sat 11/17/12	Sat 11/17/12
252	Navy and Regulator Resolution or Notice of Dispute	0%	30 d	Sat 11/17/12	Sun 12/16/12
253	Prepare Final FS Report	0%	30 d	Mon 12/17/12	Tue 1/15/13
254	USEPA, MEDEP & RAB Receive Final FS Report	0%	1 d	Wed 1/16/13	Wed 1/16/13
255	PROPOSED REMEDIAL ACTION PLAN (PRAP)	0%	230 d	Tue 9/18/12	Sun 5/5/13
256	Authorize Release of Funds	0%	1 d	Tue 9/18/12	Tue 9/18/12
257	Award PRAP/ROD and RD/RA Schedule	0%	1 d	Wed 9/19/12	Wed 9/19/12
258	Prepare Proposed Remedial Action Plan	0%	198 d	Thu 9/20/12	Fri 4/5/13
259	Prepare Draft PRAP	0%	118 d	Thu 9/20/12	Wed 1/16/13
264	USEPA, MEDEP & RAB Receive Draft PRAP	0%	1 d	Thu 1/17/13	Thu 1/17/13
265	USEPA, MEDEP & RAB Review Draft PRAP Schedule	0%	30 d	Thu 1/17/13	Fri 2/15/13
269	Navy Receives Comments on Draft PRAP	0%	1 d	Sat 2/16/13	Sat 2/16/13
270	Prepare Response to Comments Letter & Draft Final PRAP	0%	21 d	Sat 2/16/13	Fri 3/8/13
271	USEPA, MEDEP & RAB Receive Draft Final PRAP & Response to Comments Letter	0%	1 d	Sat 3/9/13	Sat 3/9/13
272	Navy and Regulator Comment Resolution	0%	14 d	Sat 3/9/13	Fri 3/22/13
273	Prepare for Public Comment Period	0%	14 d	Sat 3/23/13	Fri 4/5/13
274	Public Comment Period	0%	30 d	Sat 4/6/13	Sun 5/5/13
275	PREPARATION OF RD/RA SCHEDULE AND REMEDIAL DESIGN	0%	150 d	Thu 3/21/13	Sat 8/17/13
276	Prepare RD/RA Schedule (Secondary)	0%	90 d	Thu 3/21/13	Tue 6/18/13
277	USEPA, MEDEP & RAB Receive RD Schedule	0%	1 d	Wed 6/19/13	Wed 6/19/13
278	Regulatory and RAB Review	0%	30 d	Wed 6/19/13	Thu 7/18/13
279	Decision/Resolution Period	0%	30 d	Fri 7/19/13	Sat 8/17/13
280	RECORD OF DECISION (ROD)	0%	200 d	Sat 2/16/13	Tue 9/3/13
281	Prepare Draft ROD (Primary Document)	0%	64 d	Sat 2/16/13	Sat 4/20/13
286	USEPA, MEDEP & RAB Receives Draft ROD	0%	1 d	Sun 4/21/13	Sun 4/21/13
287	USEPA, MEDEP & RAB Review Draft ROD	0%	30 d	Sun 4/21/13	Mon 5/20/13
291	Navy Receives Comments on Draft ROD	0%	1 d	Tue 5/21/13	Tue 5/21/13
292	Prepare Response to Comments Letter & Draft Final ROD	0%	21 d	Tue 5/21/13	Mon 6/10/13
297	USEPA, MEDEP & RAB Receive Response to Comments & Draft Final ROD	0%	1 d	Tue 6/11/13	Tue 6/11/13
298	USEPA, MEDEP & RAB Review Draft Final ROD	0%	21 d	Tue 6/11/13	Mon 7/1/13
302	Navy Receives Comments on Draft Final ROD	0%	1 d	Tue 7/2/13	Tue 7/2/13
303	MEDEP Submits Letter of Concurrence/Non-Concurrence	0%	1 d	Tue 7/2/13	Tue 7/2/13
304	Prepare Final ROD	0%	20 d	Tue 7/2/13	Sun 7/21/13
305	Navy Signs Final ROD	0%	1 d	Mon 7/22/13	Mon 7/22/13
306	USEPA Receives Final ROD	0%	1 d	Tue 7/23/13	Tue 7/23/13
307	USEPA Signs Final ROD	0%	14 d	Mon 7/22/13	Sun 8/4/13
308	Navy Distributes Final Record of Decision	0%	30 d	Mon 8/5/13	Tue 9/3/13
309	REMEDIAL DESIGN	0%	501 d	Sun 3/10/13	Wed 7/23/14
310	RD Contracting Action	0%	70 d	Sun 3/10/13	Sat 5/18/13
318	Award Remedial Design	0%	1 d	Wed 7/24/13	Wed 7/24/13
319	Design To Be Determined	0%	365 d	Wed 7/24/13	Wed 7/23/14
320	REMEDIAL ACTION	0%	519 d	Thu 5/16/13	Thu 10/16/14
321	RA Contracting Action	0%	70 d	Thu 5/16/13	Wed 7/24/13
329	Award Remedial Action	0%	1 d	Thu 7/25/13	Thu 7/25/13
330	Mobilization	0%	89 d	Thu 7/25/13	Mon 10/21/13
331	Start of Significant & Continuous Onsite Activity	0%	1 d	Thu 10/16/14	Thu 10/16/14



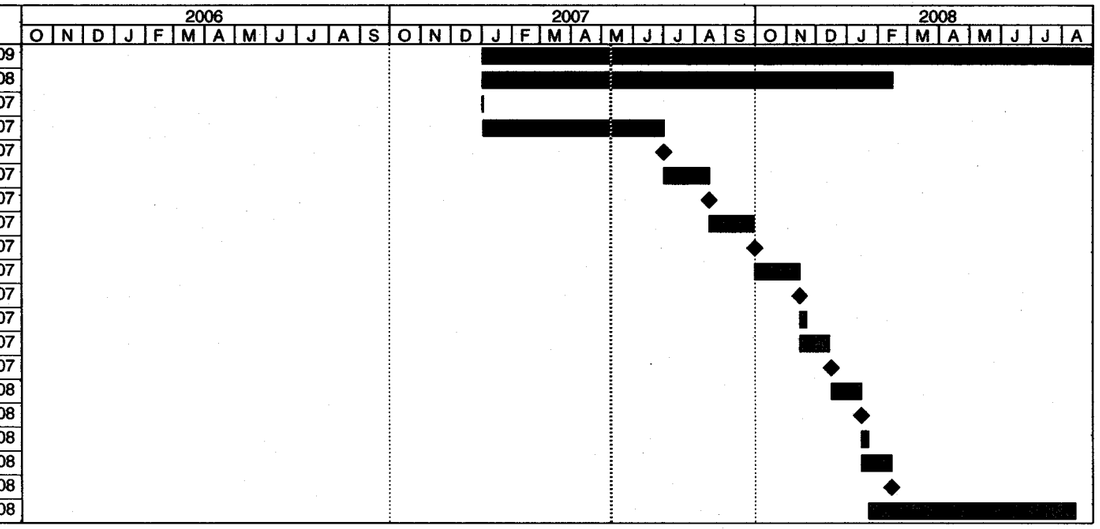
APPENDIX C.5

OU7 SCHEDULE (SITE 32)

Thu 5/10/07
12:57 PM

Portsmouth Naval Shipyard
Site Management Schedule
OPERABLE UNIT (OU) 7

ID	Task Name	%	Dur	Start	Finish
66	PHASE II RI Work Plan and Field Work	12%	784 d	Tue 1/2/07	Mon 2/23/09
67	RI WORKPLAN	20%	410 d	Tue 1/2/07	Fri 2/15/08
68	Receive Funding for Phase II	100%	1 d	Tue 1/2/07	Tue 1/2/07
69	Prepare Draft RI QAPP	75%	180 d	Wed 1/3/07	Sun 7/1/07
74	USEPA, MEDEP & RAB Receives Draft RI Workplan	0%	1 d	Mon 7/2/07	Mon 7/2/07
75	USEPA, MEDEP & RAB Review Draft RI Workplan	0%	45 d	Mon 7/2/07	Wed 8/15/07
79	Navy Receives Comments on Draft RI Workplan	0%	1 d	Thu 8/16/07	Thu 8/16/07
80	Prepare RI Workplan Response to Comments Letter	0%	45 d	Thu 8/16/07	Sat 9/29/07
85	USEPA, MEDEP Receive RI Workplan Response to Comments Letter	0%	1 d	Mon 10/1/07	Mon 10/1/07
86	USEPA, MEDEP & RAB Reviews RI Workplan Response to Comments Letter	0%	45 d	Mon 10/1/07	Wed 11/14/07
90	Navy Receives Comments on RI Workplan Response to Comments Letter	0%	1 d	Thu 11/15/07	Thu 11/15/07
91	Navy and Regulator Comment Resolution	0%	7 d	Thu 11/15/07	Wed 11/21/07
92	Prepare Draft Final RI Workplan	0%	30 d	Thu 11/15/07	Fri 12/14/07
93	USEPA, MEDEP & RAB Receive Draft Final RI Workplan	0%	1 d	Mon 12/17/07	Mon 12/17/07
94	USEPA, MEDEP & RAB Review Draft Final RI Workplan	0%	30 d	Mon 12/17/07	Tue 1/15/08
98	Navy Receives Approval, Comments, or Notice of Dispute	0%	1 d	Wed 1/16/08	Wed 1/16/08
99	Navy and Regulator Resolution or Notice of Dispute	0%	7 d	Wed 1/16/08	Tue 1/22/08
100	Prepare Final RI Workplan	0%	30 d	Wed 1/16/08	Thu 2/14/08
101	USEPA, MEDEP & RAB Receive Final RI Workplan	0%	1 d	Fri 2/15/08	Fri 2/15/08
102	Perform Round II RI Field Work	0%	205 d	Wed 1/23/08	Thu 8/14/08



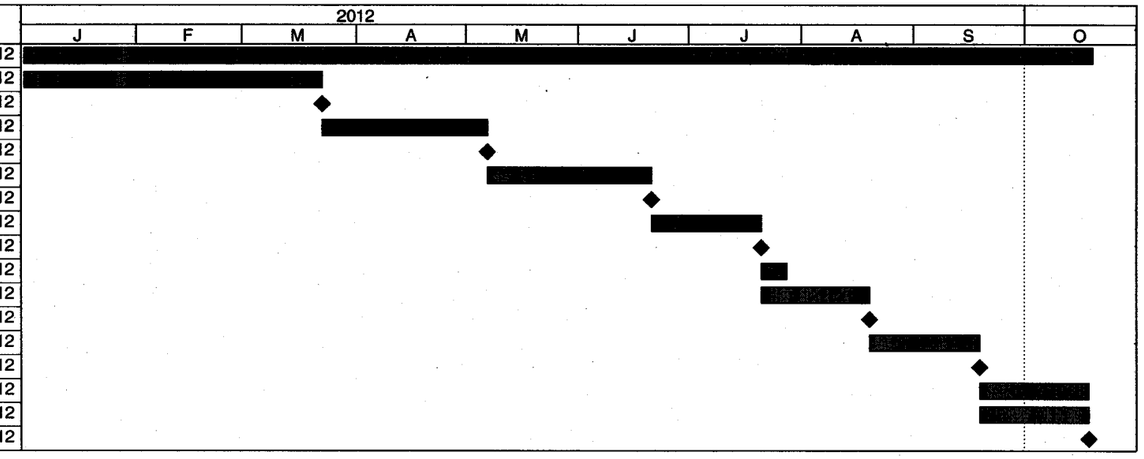
APPENDIX C.6

OU8 SCHEDULE (SITE 31)

Tue 7/11/06
12:20 PM

Portsmouth Naval Shipyard
Site Management Plan
OPERABLE UNIT 8 (OU8)

ID	Task Name	%	Dur	Start	Finish
1	RI WORKPLAN	0%	292 d	Mon 1/2/12	Fri 10/19/12
2	Prepare Draft RI Workplan	0%	81 d	Mon 1/2/12	Thu 3/22/12
7	USEPA, MEDEP & RAB Receives Draft RI Workplan	0%	1 d	Fri 3/23/12	Fri 3/23/12
8	USEPA, MEDEP & RAB Review Draft RI Workplan	0%	45 d	Fri 3/23/12	Sun 5/6/12
12	Navy Receives Comments on Draft RI Workplan	0%	1 d	Mon 5/7/12	Mon 5/7/12
13	Prepare RI Workplan Response to Comments Letter	0%	45 d	Mon 5/7/12	Wed 6/20/12
18	USEPA, MEDEP Receive RI Workplan Response to Comments Letter	0%	1 d	Thu 6/21/12	Thu 6/21/12
19	USEPA, MEDEP & RAB Reviews RI Workplan Response to Comments Letter	0%	30 d	Thu 6/21/12	Fri 7/20/12
23	Navy Receives Comments on RI Workplan Response to Comments Letter	0%	1 d	Sat 7/21/12	Sat 7/21/12
24	Navy and Regulator Comment Resolution	0%	7 d	Sat 7/21/12	Fri 7/27/12
25	Prepare Draft Final RI Workplan	0%	30 d	Sat 7/21/12	Sun 8/19/12
26	USEPA, MEDEP & RAB Receive Draft Final RI Workplan	0%	1 d	Mon 8/20/12	Mon 8/20/12
27	USEPA, MEDEP & RAB Review Draft Final RI Workplan	0%	30 d	Mon 8/20/12	Tue 9/18/12
31	Navy Receives Approval, Comments, or Notice of Dispute	0%	1 d	Wed 9/19/12	Wed 9/19/12
32	Navy and Regulator Resolution or Notice of Dispute	0%	30 d	Wed 9/19/12	Thu 10/18/12
33	Prepare Final RI Workplan	0%	30 d	Wed 9/19/12	Thu 10/18/12
34	USEPA, MEDEP & RAB Receive Final RI Workplan	0%	1 d	Fri 10/19/12	Fri 10/19/12



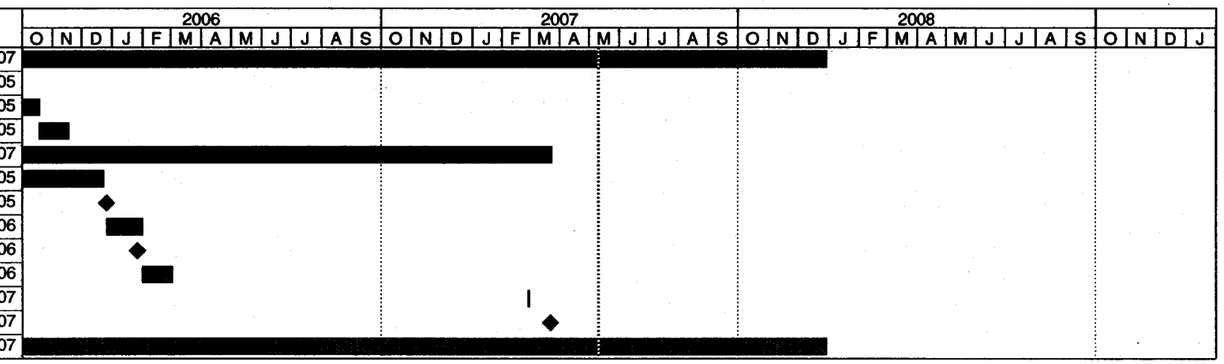
APPENDIX C.7

OU9 SCHEDULE (SITE 34)

Thu 5/10/07
4:23 PM

Portsmouth Naval Shipyard
Site Management Plan Schedule
OPERABLE UNIT (OU) 9
Site 34, Former Oil Gasification Plant (Building 62)

ID	Task Name	%	Dur	Start	Finish
84	SITE 34 REMOVAL ACTION (Secondary Document)	76%	1369 d	Wed 3/31/04	Sat 12/29/07
85	Engineering Evaluation/Cost Analysis (EE/CA)	100%	548 d	Wed 3/31/04	Thu 9/29/05
101	Prepare for Public Comment Period	100%	19 d	Fri 9/30/05	Tue 10/18/05
102	Public Comment Period	100%	30 d	Wed 10/19/05	Thu 11/17/05
103	Action Memorandum (AM)	100%	540 d	Fri 9/30/05	Fri 3/23/07
104	Prepare Draft Site 34 AM	100%	85 d	Fri 9/30/05	Fri 12/23/05
109	USEPA, MEDEP & RAB Receive Draft Site 34 AM	100%	1 d	Tue 12/27/05	Tue 12/27/05
110	USEPA, MEDEP & RAB Review Draft Site 34 AM	100%	36 d	Tue 12/27/05	Tue 1/31/06
114	Navy Receives Comments on Draft Site 34 AM	100%	5 d	Fri 1/27/06	Tue 1/31/06
115	Prepare Final Site 34 AM	100%	30 d	Wed 2/1/06	Thu 3/2/06
116	PNS Signs Final Site 34 AM	100%	1 d	Wed 2/28/07	Wed 2/28/07
117	USEPA, MEDEP & RAB Receive Final Site 34 AM	100%	1 d	Fri 3/23/07	Fri 3/23/07
118	Design and Fieldwork	50%	850 d	Thu 9/1/05	Sat 12/29/07



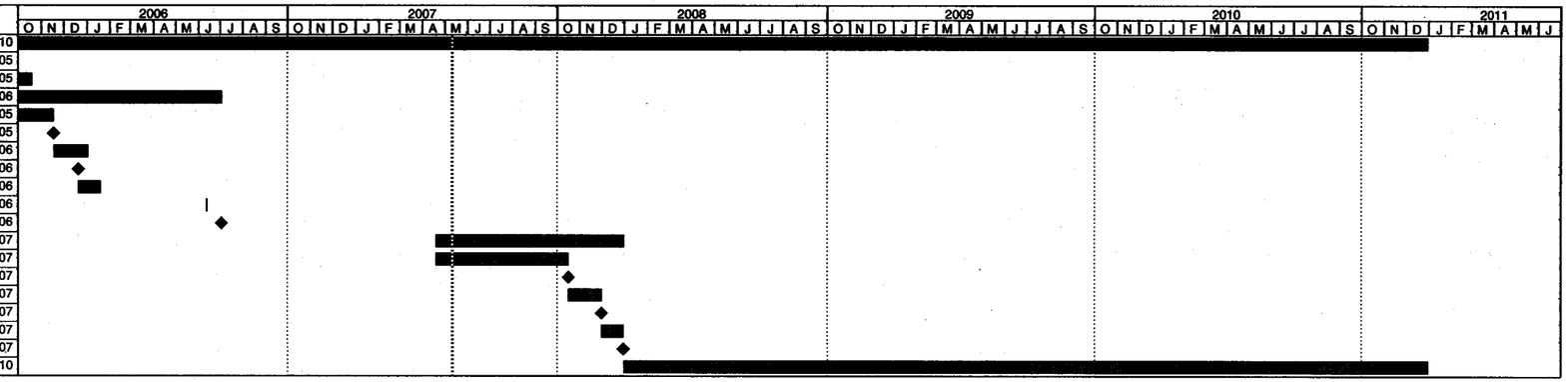
APPENDIX C.8

SITE 30, GALVANIZING PLANT BUILDING 184, SCHEDULE

Thu 5/10/07
4:25 PM

Portsmouth Naval Shipyard
Site Management Plan Schedules
Site 30, Galvanizing Plant (Building 184)

ID	Task Name	%	Dur	Start	Finish
77	SITE 30 REMVOAL ACTION	36%	2503 d	Mon 2/23/04	Thu 12/30/10
78	Revised EE/CA (Secondary Document)	100%	555 d	Mon 2/23/04	Tue 8/30/05
91	Public Comment Period	100%	50 d	Wed 8/31/05	Wed 10/19/05
94	Revised Action Memorandum (Secondary Document)	100%	286 d	Wed 9/21/05	Mon 7/3/06
95	Prepare Revised Draft Site 30 Action Memorandum	100%	58 d	Wed 9/21/05	Thu 11/17/05
96	USEPA, MEDEP & RAB Receive Revised Draft Action Memorandum	100%	1 d	Fri 11/18/05	Fri 11/18/05
97	USEPA, MEDEP & RAB Review Revised Draft Action Memorandum	100%	45 d	Sat 11/19/05	Mon 1/2/06
98	Navy Receives Comments on Revised Draft Action Memorandum	100%	14 d	Wed 12/21/05	Tue 1/3/06
99	Prepare Final Action Memorandum	100%	30 d	Wed 12/21/05	Thu 1/19/06
100	PNS Signs Final Action Memorandum	100%	1 d	Tue 6/13/06	Tue 6/13/06
101	USEPA, MEDEP & RAB Receive Final Action Memorandum	100%	1 d	Mon 7/3/06	Mon 7/3/06
102	Removal Action Work Plan (Secondary Document)	10%	256 d	Fri 4/20/07	Mon 12/31/07
103	Prepare Draft Site 30 Removal Action Work Plan	20%	180 d	Fri 4/20/07	Tue 10/16/07
110	USEPA, MEDEP & RAB Receive Draft Work Plan	0%	1 d	Wed 10/17/07	Wed 10/17/07
111	USEPA, MEDEP & RAB Review Draft Work Plan	0%	45 d	Wed 10/17/07	Fri 11/30/07
115	Navy Receives Comments on Draft Work Plan	0%	1 d	Sat 12/1/07	Sat 12/1/07
116	Prepare Final Work Plan	0%	30 d	Sat 12/1/07	Sun 12/30/07
117	USEPA, MEDEP & RAB Receive Final Work Plan	0%	1 d	Mon 12/31/07	Mon 12/31/07
118	Perform Site 30 Removal Action	0%	1095 d	Tue 1/1/08	Thu 12/30/10



APPENDIX D

SITE UPDATE FACT SHEET

PORTSMOUTH NAVAL SHIPYARD

Kittery, ME

Update on Installation Restoration Program Sites

Introduction

This Fact Sheet describes the sites and their status within the Installation Restoration (IR) Program at the Portsmouth Naval Shipyard (PNS), Kittery, Maine. These sites are in various phases of cleanup under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, commonly known as Superfund). The Fact Sheet explains the various clean-up, or remedial, phases and indicates which phase of the CERCLA process each site is in as of September 30, 2006. Additional information related to the history of PNS, the IRP sites, and the environmental regulatory process for PNS is provided in the FY07 Amended Site Management Plan (SMP).

PNS is a federal facility and because investigations have been conducted under several regulatory programs, including CERCLA and the Resource Conservation and Recovery Act (RCRA), the investigative history for PNS has been complicated. However, a Federal Facility Agreement (FFA) between the Navy and U.S. Environmental Protection Agency (USEPA) called for the Navy to meet the provisions of CERCLA, as well as RCRA, and applicable state law. The process required by the FFA is comparable to CERCLA, which is described below.

IR Sites and Site Screening Areas (SSAs) at PNS

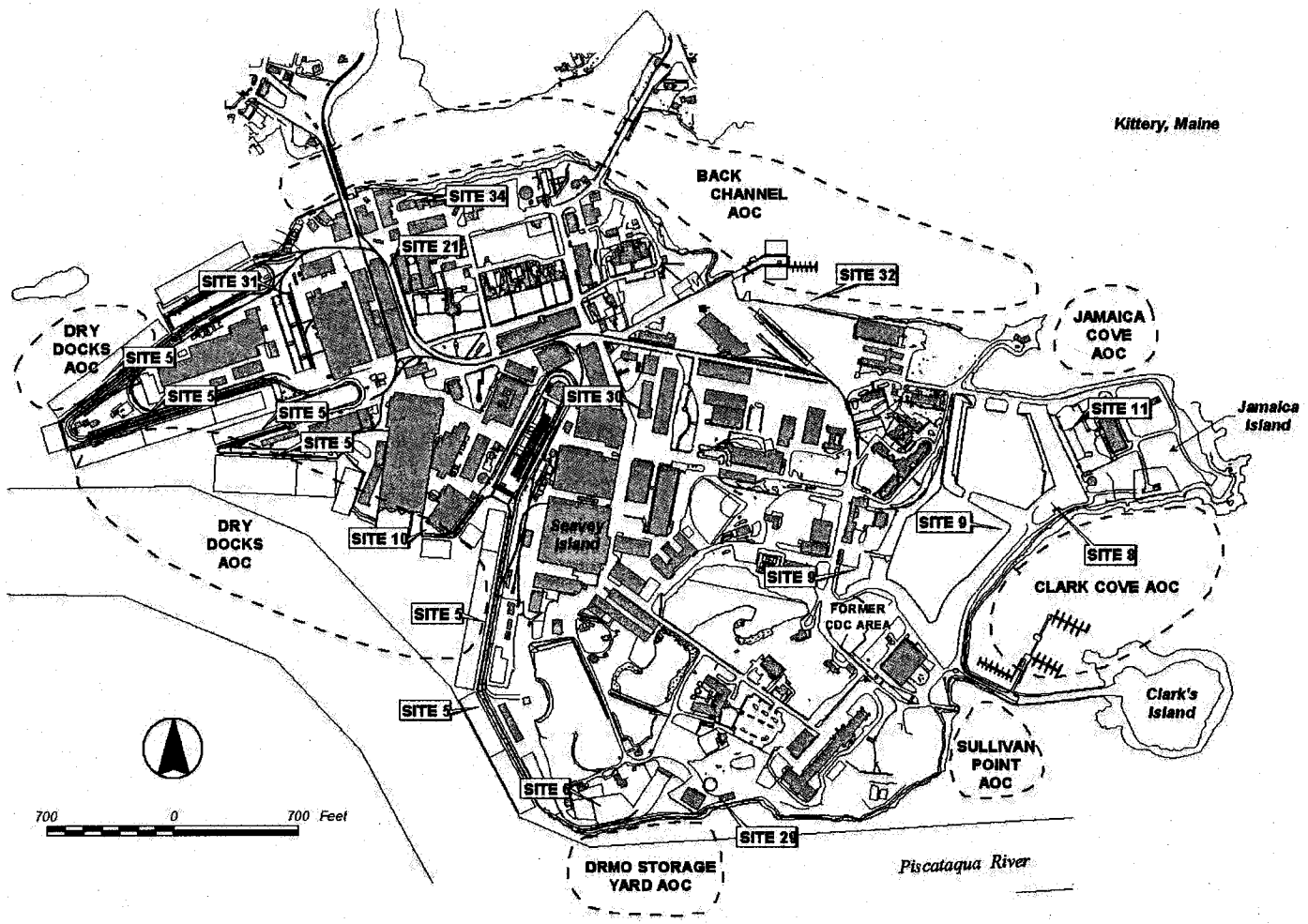
The IR sites at PNS have been grouped as operable units (OUs) so sites that are near each other or that have similar characteristics are addressed together. The locations are shown on Figure 1. Currently, the OUs are as follows:

- OU1: Site 10 - Former Battery Acid Tank No. 24 and Site 21 - Former Acid/Alkaline Drain Tank (groundwater only).
- OU2: Site 6 - Defense Reutilization and Marketing Office Storage Yard (DRMO) and Site 29 - Former Teepee Incinerator Site.
- OU3: Soil/fill material and groundwater within the Jamaica Island Landfill (JILF) boundary, including Site 8 - JILF, Site 9 - Former Mercury Burial Sites (MBI and MBII), and Site 11 - Former Waste Oil Tanks Nos. 6 and 7 and management of migration from the JILF.
- OU4: Site 5 - Former Industrial Waste Outfalls, and Offshore Areas Potentially Impacted by PNS Onshore Sites (Offshore Areas of Concern).
- OU7: Site 32 - Topeka Pier Site.
- OU8: Site 31 - West Timber Basin.
- OU9: Site 34 - Former Oil Gasification Plant (Building 62).

In addition to the IR sites, one SSA is currently under investigation at PNS:

- Site 30 - Galvanizing Plant Building 184.

Figure 1: Portsmouth Naval Shipyard Facility Site Map



Operable Units and Site Screening Locations at PNS	
Operable Unit 1:	Site 10-Former Battery Acid Tank No. 24 Site 21-Former Acid/Alkaline Drain Tank (groundwater)
Operable Unit 2:	Site 6-Defense Reutilization and Marketing Office (DRMO) Storage Yard Site 29-Former Teepee Incinerator Site
Operable Unit 3:	Site 8-Jamaica Island Landfill (JILF) Site 9-Former Mercury Burial Sites Site 11-Former Waste Oil Tanks Nos. 6 & 7.
Operable Unit 4: (Offshore Area)	Site 5-Former Industrial Waste Outfalls Offshore Areas potentially impacted by onshore IRP sites (Six AOCs have been delineated)

Operable Units and Site Screening Locations at PNS	
Operable Unit 7:	Site 32-Topeka Pier Site
Operable Unit 8:	Site 31-Former West Timber Basin
Operable Unit 9:	Site 34-Former Oil Gasification Plant
Site Screening Area:	Site 30-Former Galvanizing Plant Building 184

CERCLA Remedial Phases

The CERCLA clean-up process has several phases. Investigations at some of the sites were conducted under RCRA; therefore, the corresponding RCRA phase is also indicated.

The preliminary assessment/site inspection (PA/SI) is the initial study conducted under CERCLA at a site in response to a real or suspected hazardous substance release. The comparable step under the FFA is the site screening process (SSP), and, under RCRA, this phase of investigation is the RCRA facility assessment (RFA). The SSP, RFA, and PA/SI are the tools under the different regulatory programs for evaluating whether identified SSAs should proceed to the RI/FS stage for further investigation. (SSAs are areas not previously identified that may pose a threat, or potential threat, to public health, welfare, or the environment.)

If the initial study of a site indicates the need for further investigation, a remedial investigation/feasibility study (RI/FS) is conducted under the CERCLA remedial process. The RI is intended to determine the nature and extent of contamination, potential migration pathways, the toxicity and persistence of contamination, and the potential (risk) for adverse impacts to human health or the environment. The FS is intended to develop the objectives for site cleanup, to identify regulations and guidance relevant to the site that must be considered in clean-up activities, and to identify and evaluate the possible clean-up options for the site. The RCRA facility investigation (RFI)/corrective measures study (CMS) corresponds with the RI/FS process.

The next stage in the process is the Proposed Plan (also known as a Proposed Remedial Action Plan or PRAP), which outlines the Navy's proposed clean-up alternative. The Proposed Plan is provided to the public for their review and comment during a formal comment period.

At the end of the formal comment period and consideration of the public's comments on the Proposed Plan, the Navy prepares a Record of Decision (ROD) that identifies the selected clean-up option. The USEPA and the Navy sign the ROD, and the Maine Department of Environmental Protection (MEDEP) issues a letter of concurrence or non-concurrence. RCRA does not have a process similar to the Proposed Plan/ROD.

The ROD establishes the scope of the remedial, or clean-up, design and subsequent remedial action. Pre-design investigations are sometimes necessary to gather more information to support the design. The RCRA corrective measures implementation (CMI) corresponds with the remedial design (RD)/remedial action (RA) process.

At any time during the investigation of a site, the Navy may conduct a removal action or an interim remedial action for a site to reduce the threat to human health or the environment by removing released hazardous substance or reducing potential exposure pathways. For the removal action, an engineering evaluation/cost analysis (EE/CA) is prepared to select the best removal action for the site. A focused FS may be prepared to identify an interim removal action. An Interim Proposed Plan and Interim ROD are prepared as part of the selection of the interim action.

Site Descriptions and Status

The following provides a description of each site (by OU) with the current status of the site. Table 1 shows a summary of the status of each site.

OU1 consists of Site 10 - the Former Battery Acid Tank No. 24 and Site 21 - the Former Acid/Alkaline Drain Tank (groundwater concerns only). The sites in OU1 are located in the western portion of PNS. OU1 is in the RI stage of the CERCLA process.

Site 10 was an underground, 9,680-gallon steel holding tank that was used from 1974 until 1984 for waste lead battery acid from battery rebuilding operations. The tank was taken out of service in 1984 when it was found to be leaking, and the tank was removed in 1986. Subsequently, the area of investigation was expanded to include potential tank fill line leaks. Investigations were previously conducted at the site in 1991 (of soil around the tank) and in 1998 (of soil around the tank and fill lines and of groundwater by the tank). Based on the results of the 1998 investigation, it was determined that additional information on soil and groundwater contamination at the site was necessary. The additional investigation was performed in November 2001. The report with the results of the November 2001 investigation was finalized in March 2003. Based on the recommendations in the report, the Navy is investigating the nature and extent of lead contaminated soil and collecting additional lead

Table 1

Installation Restoration Program Status
Portsmouth Naval Shipyard, Kittery, Maine

LEGEND
- ✶ Interim ROD
- ◆ In process
- ● Complete

SITE #, SITE NAME	Preliminary Assessment	Site Investigation	No Further Action Decision Document	Engineering Evaluation/Cost Analysis	Action Memorandum	Removal Action	Removal Action Report	Remedial Investigation	Feasibility Study	Proposed Remedial Action Plan	Record of Decision	Remedial Design	Remedial Action	Remedial Action Report	Long Term Operations	Long Term Monitoring	Preliminary Close Out Report	Close Out Report	Notice of Intent to Delete	Site Deletion	Site Closed Out
Operable Unit 1																					
10, Former Battery Acid Tank	●	●						◆													
21, Former Acid/Alkaline Drain Tank	●	●						●													
Operable Unit 2																					
6, Defense Reutilization Marketing Office (DRMO)	●	●						◆	◆												
29, Former Teepee Incinerator Site	●	●						◆	◆												
Operable Unit 3																					
8, Jamaica Island Landfill (JILF)	●	●						●	●	●	●	●	●	◆	◆	◆					
9, Former Mercury Burial Vaults I and II	●	●			●	●	●	●	●	●	●	●									
11, Former Jamaica Island Waste Oil Tanks	●	●						●	●	●	●	●									
Operable Unit 4 Offshore	●	●						◆		●	✶										
5, Former Industrial Waste Outfalls	●	●						◆		●	✶										
Operable Unit 7, Site 32, Topeka Pier Site	●	●						◆													
Operable Unit 8, Site 31, Former West Timber Basin	●	●						◆													
Operable Unit 9, Site 34, Former Oil Gasification Plant	●	●		●	●	◆		◆													
Study Areas																					
30, Former Galvanizing Plant	●	◆		●	●	◆															
No Further Action under CERCLA																					
12, Bldg 72, Boiler Blowdown Tank	●	●	●																		
13, Bldg 76, Rinse Water Tank	●	●	●																		
16, Bldg 174, Rinse Water Tank	●	●	●																		
23, Bldg 174, Chemical Cleaning Facility Tank	●	●	●																		
26, Portable Oil/Water Tanks	●	●	●																		
27, Industrial Area, Berth 6	●	●	●																		

data for groundwater at the site. The field work was conducted in July and August 2006. The 1998, 2001, and 2006 investigations are part of the RI for Site 10.

Site 21 was a 695-gallon underground steel tank used from 1974 until 1991 to hold discharge from two washing machines. The washing machines were used to clean air filters, which were used to remove dirt and debris from ships. In 1991, as part of the RFI for PNS, the tank was excavated and removed in accordance with a closure plan. The tank was not intact. Stained fill and exposed bedrock were evident in the excavation. Confirmation soil samples were collected from the excavation, which was then backfilled with clean fill and covered with asphalt. The Navy, USEPA, and MEDEP agreed that no further action was necessary for soil and that groundwater will be investigated as part of the Site 31 investigation, and documented this decision in a Consensus Document signed in October 1996. The investigation of Site 31 was conducted in the summer of 1998. The results indicated that groundwater has not been impacted by Site 21 and the Navy recommended no further action for Site 21 groundwater.

OU2 consists of Site 6 - the DRMO and Site 29 - Former Teepee Incinerator Site. The sites are located in the southern portion of PNS. The RI for OU2 (including the revised risk assessment completed in 2000) are complete and the Navy is conducting an FS. During preparation of the draft FS report, it was determined that additional site characterization is necessary to finalize the FS. The Navy will conduct a supplemental RI before finalizing the FS report.

Site 6 has been in operation since approximately 1940. The 2-acre area is used for temporary storage of used materials that are to be taken off site for recycling or disposal. Practices that resulted in obvious sources of contaminants, such as open storage of batteries, were ended in approximately 1983. Currently, within the fenced area of the DRMO, asphalt or an interim cap covers most of the surface.

Heavy metal contamination of soils at the site was identified in 1984. The site was further investigated from 1989 to 1992 (as part of the RFI for PNS), in 1995 (as part of the RFI Data Gap Investigation for PNS), and during the 1996/1997 groundwater monitoring program for PNS to determine the nature and extent of contamination at the site and the potential risks associated with the contamination. Interim corrective measures were conducted in 1993 including capping of areas of the site with high metals concentrations as well as installing stormwater controls. These measures were conducted to reduce the spread of site contamination.

Shoreline erosion that exposed contaminated soil at Site 6 was discovered in the summer of 1999, and interim erosion controls were put in place in September 1999. The shoreline was regraded in November 1999.

Site 29 includes the area surrounding Buildings 298 and 310 along the southern shoreline of PNS. The site encompasses the area around a former open burning area and a former industrial incinerator (Teepee Incinerator) and waste disposal area. The Navy identified some areas of erosion along the shoreline of Site 29 and in November 2005 and June 2006 the Navy conducted a removal action to provide shoreline stabilization in the areas of erosion.

Sampling as part of the RFI for PNS included Site 29 within the DRMO investigation boundary. Subsequent to the RFI, the area of Site 29 has been investigated as a separate site. The site was further investigated as part the 1996/1997 groundwater monitoring program for PNS and the 1998 field investigation at the site to determine the nature and extent of contamination at the site and the potential risks associated with the contamination.

OU3 consists of Site 8 - Jamaica Island Landfill, Site 9 - Former Mercury Burial Sites, and Site 11 - Former Waste Oil Tank Nos. 6 and 7. OU3 is located in the eastern portion of PNS. The RD/RA stage of the remedial process is complete and long-term operation, maintenance, and monitoring (OM&M) is being conducted.

The JILF was a tidal mudflat that the Navy used as a disposal area from 1945 to 1978 for general refuse, trash, construction rubble, and various industrial wastes. Site 9 comprises two mercury burial vaults (MBI and MBII) that were placed in the landfill in the 1970s and were removed intact in the 1990s/early 2000. Site 11 consists of two tanks, nos. 6 and 7, in the northeastern corner of JILF that were used from 1943 to 1989 and were removed (intact) in 1989. There is evidence, however, that spills occurred during earlier tank filling.

Sampling of the sites within OU3 was conducted as part of the RFI for PNS, the RFI Data Gap for

PNS, and the 1996/1997 groundwater monitoring for PNS to determine the nature and extent of contamination at the site and the potential risks associated with the contamination. After the revised risk assessment for OU3 was complete (in 2000), the Navy prepared an FS for OU3 in 2000. The Proposed Plan for OU3 was issued January 2001 and the ROD was signed in August 2001. An Explanation of Significant Difference (ESD) was signed in September 2003 and an ESD was signed in October 2005 to document changes to the OU3 remedy based on construction activities.

Remedial action at OU3 consists of a cover over the landfill, institutional controls to limit use of and exposure to the area, shoreline erosion controls, and long-term monitoring of the effectiveness of the remedy. The design of this action was completed in January 2003. The first phase of the design included movement of the waste in the portion of the landfill near Jamaica Cove to the remaining portion of the landfill to consolidate the waste in a smaller area. After the consolidation, wetlands were constructed in Jamaica Cove. The consolidation activities were completed in September 2002. The wetlands planting was completed in the spring 2003. The second phase of the design included construction of the cover over the landfill and shoreline erosion controls. Construction activities began in the spring 2003 and were completed in the fall of 2004. Additionally, in 2004 an area of waste was identified in Clark Cove outside the revetment. The area was excavated and the waste placed on the landfill under the cover system. The area was backfilled with stone and silty sand. The Remedial Action Report, which documents the remedial construction activities, was completed in May 2006.

The Navy prepared the operation, maintenance, and monitoring plan for the OU3 remedy and conducted the first round of monitoring and inspection in July 2006. The second round of monitoring and inspection is scheduled for December 2006.

In October 2000 (after preparation of the FS), the JILF was split into two OUs: OU3 addressed source control (soil and groundwater within the JILF boundary) and OU6 addressed management of groundwater migration (migration in the intertidal areas offshore of the JILF). The split was made so that the remedy for soil/landfill material and groundwater within the landfill boundary could move forwrd without delay to address concerns at that time for groundwater migration. Remedial construciton activities at OU3 have changed conditions in the area and the OU3 OM&M program was deisgned to address groundwater migration concerns. Therefore, it was determined that separation of the OUs was no longer required to efficiently address groundwater migration separate from source control. The Navy preparaed an ESD (signed in October 2005) for the ROD for OU3 to document that the migration of groundwater from the JILF will be addressed under the OU3 remedy. Therefore, subsequent to October 2005, OU6 was recombined with OU3.

At the time the RFI for PNS was conducted, the Child Development Center (CDC) was located to the west of the JILF. Sampling, as part of the RFI, was conducted in this area to ensure that the children at the CDC were not being exposed to soil contaminated by wind dispersal of JILF contamination. The CDC has since been moved to a different location and this area is now referred to as the Former CDC. The building and playground equipment have been removed and the area is currently used as an open-green space, with grass and trees covering the area. The Navy determined that additional sampling was needed at the Former CDC before determining a final remedial action. The Navy finalized the work plan and conducted the sampling in August 2003. The report on the investigation was finalized in March 2003 and the Navy recommended no further action for this area. A no further action decision document will be prepared.

OU4 is the PNS offshore area and consists of Site 5 - Former Industrial Waste Outfalls and Offshore Areas Potentially Impacted by PNS Onshore Sites. Site 26 - Portable Oil/Water Tanks was previously included within OU4. Sites 5 and 26 were included in OU4 because these two sites had potential offshore impacts, but no potential onshore impacts. The Navy is currently conducting an interim action for OU4 (as discussed below) before preparing an FS for OU4.

Site 5 consisted of several discharge points along the Piscataqua River, near Berths 6, 11, and 13. The outfalls were used to discharge liquid industrial wastes from plating and battery shops prior to construction of the Industrial Waste Treatment Plant. They are believed to have been in operation from 1945 to 1975, and they may have contained heavy metals (mercury, lead, cadmium, chromium, copper, and zinc), oil and grease, and polychlorinated biphenyls (PCBs).

Site 26 was the oil/water tanks at the submarine berths used for the clean-out of submarine bilges and various tanks. The resulting oily wastes are

pumped for offsite disposal. Although the tanks are still in use, operations have been modified and equipment improved over the years to eliminate spillage and improve handling methods. In August 2001, a decision document was signed for no-further action under CERCLA and this site has been removed from OU4.

Offshore areas refer generally to areas in the Piscataqua River offshore of PNS that may have been affected by the release of hazardous waste or hazardous constituents from any site or study area located at PNS. Sampling of the offshore areas from 1991 to 1993 was conducted as part of the estuarine ecological risk assessment (EERA). A human health risk assessment was conducted using the EERA data. Based on the results of the risk assessment, the Navy determined that interim monitoring was warranted for OU4 to determine whether onshore remedial actions, natural processes, and/or other sources may have impacted the offshore areas. An Interim ROD was signed in May 1999 that requires the Navy to conduct this interim offshore monitoring. A monitoring plan has been prepared and to date eight rounds of sampling have been completed. A baseline report summarizing the first four rounds of sampling was finalized in July 2002. The summary report of the first seven rounds of sampling was finalized in November 2004 and based on the evaluation of the seven rounds of data the report recommends additional sampling and evaluation (referred to as "additional scrutiny") for several of the monitoring stations. The Navy prepared a work plan for these additional activities. Field work for additional scrutiny and Round 8 of the interim offshore monitoring program was conducted in August 2005. The Navy is preparing a report of the results.

In 2001, ecological preliminary clean up levels (preliminary remediation goals or PRGs) were developed for OU4 using the interim offshore monitoring data. The PRGs are being used as interim remediation goals for the OU4 interim monitoring to determine whether additional scrutiny is required. In addition, the PRGs may be used as part of the OU4 FS to evaluate possible remedies.

OU7 is Site 32, the Topeka Pier Site, which is the fill area east of Dennett's Island and north of Seavey Island near Topeka Pier. Various materials were used to fill the area, including bricks, wood, glass, asbestos cloth, and foundry waste. An RI was recommended for the site based on the site screening investigation conducted in 1998. The Navy finalized the work plan (referred to as a Quality Assurance Project Plan or QAPP) for the RI investigation and conducted the first phase of field work in April and May 2003. The Navy prepared a technical memorandum that provides the results of the evaluation of the first phase of field work and recommendations for the second phase of field work. In 2005, increased erosion was noted along the Site 32 shoreline and in May and June 2006 the Navy conducted a removal action to stabilize the shoreline.

OU8 is Site 31, the Former West Timber Basin. The site is a portion of the filled area between Dry Docks 1 and 3. Original operations at the site were storage and seasoning for wood used in the production of Navy ships. Metal washing and pickling activities were also conducted at the site. A site screening investigation was conducted at the site in 1998, and based on the results, an RI was recommended for the site.

OU9 is Site 34, the Former Oil Gasification Plant, Building 62 and it is located in the western portion of PNS. It originally served as an illuminating gas manufacturing plant. It was later used as a blacksmith shop from approximately 1915 to 1930 and from approximately 1930 to present has been used by Public Works. Pesticide storage in a portion of the building occurred from approximately 1960s to 1985. Currently the building is used as the bobcat (mini bulldozer) maintenance shop and storage. Ash was noted on the northern side of the building and six drums of the ash were removed in 1999. The Navy finalized the work plan (QAPP) to collect data for the site investigation (SSP) for Site 34 and to support a removal action for the ash. The field work was completed in April 2003 and the Navy prepared the site screening report, which among other things recommends the site for an RI. In the spring of 2004, the Navy conducted additional investigation to determine the extent of ash at Site 34. The Navy prepared an EE/CA to identify removal action alternatives for the ash and held a public comment period in fall 2005 and the Navy prepared an Action Memorandum to document the selected alternative. The Navy is currently preparing the planning documents for the removal action.

Site 30 is the Former Galvanizing Plant, Building 184, is located in the north-central portion of PNS, is currently under an SSI investigation (as part of the SSP). The building, constructed in 1943, includes an acid-proof pit in which pickling

tanks were used as part of the galvanizing operations and later as part of the Clean Room Facility. Use of the pit was discontinued in the early 1960s and the pit was filled and covered with a concrete floor. Over the years, a crystalline substance has been noted along the edges of the pit. The Navy periodically removes the crystalline substance. The most recent removal was conducted in June 2006. All crystalline material along the eastern edge of the interior wall in Building 184 was removed and a vinyl liner was installed to cover the cleaned wall and floor area. Based on investigation of soil and groundwater outside the building (in 1998) and in the pit (in 2001), the Navy has recommended that a removal action be conducted for the pit before determining whether an RI is necessary for the site. The Navy finalized the EE/CA in December 2002 and held the public comment period on the final EE/CA in January and February 2003. The Navy has determined that currently Building 184 operations cannot be disrupted by the removal action activities; therefore, additional removal action alternatives were evaluated and the Navy prepared a revised EE/CA. A public comment period was held in fall 2005 and the Navy prepared an Action Memorandum to document the selected removal action alternative.

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