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LETTER AND U S NAVY RESPONSE TO U S EPA REGION I AND MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION REGARDING REVISED DRAFT FEASIBILITY STUDY FOR OPERABLE UNIT 2 (OU 2) NSY PORTSMOUTH ME
10/26/2010
TETRA TECH NUS

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PITT-10-10-063

October 26, 2010

Project Number 112G00924

Mr. Matthew Audet
USEPA, Region 1
5 Post Office Square
Suite 100
Mail Code OSRR07-3
Boston, Massachusetts 02109-3912

Mr. Iver McLeod
Maine Department of Environmental Protection
State House Station 17
Augusta, Maine 04333-0017

Reference: Contract No. N62467-04-D-0555 (CLEAN)
Contract Task Order No. 444

Subject: Responses to Comments on the Revised
Draft Feasibility Study for Operable Unit 2 (OU2)
Portsmouth Naval Shipyard (PNS), Kittery, Maine

Dear Mr. Audet/Mr. McLeod:

On behalf of the U.S. Navy, Tetra Tech NUS, Inc. is pleased to provide to the U.S. Environmental Protection Agency Region I (USEPA) and to the Maine Department of Environmental Protection (MEDEP) 2 and 3 copies, respectively, of the responses to MEDEP comments dated December 23, 2008, USEPA comments dated March 9, 2009, and USEPA legal comments dated April 29, 2010 on the Revised Draft FS Report for OU2 and 1 copy each of the electronic document (on CD).

In accordance with the project schedule, comments are due by **November 26, 2010**.

If you have any comments or questions, or if additional information is required, please contact Ms. Linda Cole at 757.341.2011.

For the Community Restoration Advisory Board (RAB) members; if you have any comments or questions on these issues, they can be provided to the Navy at a RAB meeting, by calling the Public Affairs office at 207.438.1140 or by writing to:

Portsmouth Naval Shipyard
Public Affairs Office
Attn: Danna Eddy
Portsmouth, NH 03804-5000

Sincerely,

Deborah J. Cohen
Project Manager

DJC/clm
Enclosure

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RESPONSES TO TECHNICAL COMMENTS
DRAFT FEASIBILITY STUDY REPORT FOR OPERABLE UNIT 2
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

The comment responses presented below have been developed to reflect the action items identified during the November 17 to 20, 2008 conversations held between the Navy, Portsmouth Naval Shipyard, Maine Department of Environmental Protection (MEDEP), United States Environmental Protection Agency (USEPA), and Tetra Tech NUS, Inc. (TtNUS) and resolution of MEDEP and USEPA comments on the September 2008 Draft OU2 Supplemental Remedial Investigation (RI) Report. Notes capturing the November 2008 discussions and action items are presented as Attachment A to this response to comments letter. OU2 RI comment resolution, including responses to comments and meeting minutes, are documented in Appendix D of the March 2010 Final OU2 Supplemental RI Report. These responses to comments on the OU2 Feasibility Study (FS) Report provide specific responses and text revisions, where appropriate, related to the development and evaluation of remedial alternatives for OU2. Responses to comments that are related to risk or RI issues refer to the resolution of comments as provided in the OU2 RI.

As a result of FS related conversations and resolution of RI issues, the following major edits will be made to the alternatives in the Draft Final OU2 FS Report. A more detailed description of the alternatives is provided in Attachment B in these responses to comments.

1. The FS will be revised to clearly indicate that areas within the footprints of the buildings are within the limits of OU2 and are considered a part of the remedy, Alternatives will be revised to include Land Use Controls (LUCs) for the soil beneath building footprints if soil beneath the buildings is not removed or treated,

2. Alternative DRMO-3 will be revised to include the removal of all material within the DRMO area limits (including the existing interim cap area), with the exception of the material that is located beneath Building 298. LUCs would be used to prevent unacceptable human exposure to contaminated soil located beneath Building 298. Groundwater monitoring would be conducted following removal to address uncertainties related to contaminant migration.

3. Alternative DRMO-4 will be revised to include the removal of all contaminated soil exceeding the construction worker cleanup levels, including the interim cap area, with the exception of the material that is located beneath Building 298. LUCs would be used to prevent unacceptable human exposure to contaminated soil. Groundwater monitoring would be conducted following removal to address uncertainties related to contaminant migration.

4. Alternative DRMO-5 will be revised to remove the contaminated soil outside the interim cap area with concentrations exceeding the construction worker cleanup goals and transporting the soil off-yard for disposal. A permanent cap (RCRA C) would be constructed in the area where the interim cap is currently located. The permanent cap would meet the requirements established for the closure of landfills within the State of Maine. LUCs would be used to prevent unacceptable human exposure to contaminated soil. Groundwater monitoring would be conducted following removal to address uncertainties related to contaminant migration.

5. The western site limit lines will be dashed to indicate uncertainty in the limits of the site in this area and language will be added to the FS to indicate that a pre-design investigation will be performed to determine the need to extend the limits of the site in this area.

Attachment C provides revised text for Sections 1 and 2 that reflect revisions based on the responses to MEDEP and USEPA technical comments and USEPA Legal comments.

RESPONSES TO MEDEP COMMENTS DATED DECEMBER 23, 2008
DRAFT FEASIBILITY STUDY REPORT FOR OPERABLE UNIT 2
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

General Comments

1. **Comment:** In Section 1, the text notes in several places that the DRMO cap is "interim". In discussion with Navy at the November 20, 2008 technical meeting there was agreement to provide supporting information that would demonstrate that the cap can serve as a permanent remedy for that portion of the DRMO. This information must be reviewed by MEDEP engineering staff to ensure the cap is sufficiently protective. Until we agree with the Navy's supporting information the existing interim cap should not be considered an effective alternative or component of an alternative.

   Response: Based on the November 2008 technical meeting the Navy agreed that the existing cap at the DRMO was an interim measure and that alternatives for addressing contamination under the cap will be revised. Revised alternatives are provided in Attachment B attached to these responses to comments.

2. **Comment:** According to data from previous investigations there are concentrations of lead as high as 255,000 mg/kg – 25.5% – at the southwest corner of Building 298 in the top six inches of soil. Other nearby locations have soil concentrations of 130,000 mg/kg and 110,000 mg/kg in the top two feet of soil. MEDEP's Remedial Action Guidelines do not allow any anthropogenic compounds in soil at concentrations greater than 10,000 ppm (1%). The interim cap does cover these locations however, regardless of the cap, either interim or permanent, such highly contaminated soil must be removed and transported to a proper disposal facility. In addition to MEDEP policy regarding soil contamination, the concentrations are too high to risk any possible erosion into the river due to potential future catastrophic flooding resulting from global warming.

   Response: Based on the November 2008 technical meetings alternatives will be revised so soil with high lead (greater than cleanup levels for the protection of construction workers) would either be removed or capped with a permanent cap system that would meet MEDEP published performance standards and would prevent the erosion of the soil beneath the cap system. For these alternatives the MEDEP performance standards for cap construction would become an applicable action-specific ARAR.

3. **Comment:** There are several places in the text, especially the tables in Section 5, where the word "implantation" has been used where "implementation" should be used. Please correct these errors.

   Response: The text will be corrected.

Specific Comments

4. **Comment:** 1.4.2 and 1.4.3, pp. 1-4 – 1-5: Based on discussion at the technical meeting regarding the removal of contaminated soil and regrading of the area near Building 348, the text needs to reference this area as it is likely a part of past DRMO activity. If the evaluation of this area determines residual impacted soils remain, then the figures and calculations of areas/volumes may need to be revised.

Response: The Navy concurs that there is uncertainty regarding the site boundary and remedial areas in this western portion of OU2. The text in Sections 1.0 and 2.0 will be revised, based on the March 2010 Final OU2 Supplemental RI Report, to reflect that uncertainty. The alternatives text in Section 4.0 will be revised to state that pre-design samples will be collected prior to the implementation of a remedial action to resolve the uncertainties associated with the western limits of OU2 contamination. The western area will be included in the site boundary as appropriate based on the results of the pre-design investigation.

5. **Comment:** 1.5, p. 1-9: "...the trench is considered a clean area within OU2." The MEDEP has no record of ever receiving the November 2005 Building 298 Trenching Closeout Report in which the clean designation was made. Please forward a copy of this document to us. If contamination exists below the depth of the trench land use controls will be necessary to prevent excavation into contaminated soil.

   Response: This information was discussed in the OU2 Additional Investigation QAPP (TtNUS, October 2007). The November 2005 Building 298 Trenching Closeout Report is available in the Administrative Record as document N00102.AR.001510.

   Based on the concentrations within the residual soil under the trench, LUCs are not necessary for this area. Soil borings in the area of the trench were targeted to a depth of 10 feet below ground surface (bgs). The trench was excavated to 4 feet bgs. Only one exceedance of PRGs was detected in the 4 to 10 foot depth. One soil boring from 8 to 10 feet bgs exceeded the residential PRG for lead (400 mg/kg) with a value of 438 mg/kg. Therefore, LUCs are not required for this area.

6. **Comment:** 2.1.2., 2-6, first paragraph: "...there are no wetlands...". After this phrase please add "as defined in EO11990..." to differentiate it from the definition of wetlands as defined in MEDEP Ch. 1000. As defined in Ch. 1000 the shoreline at OU2 is considered a wetland.

   Response: The referenced paragraph on the Federal Protection of Wetlands Executive Order 11988 will be removed from the text because the requirements of the Executive Order have been removed from 40 CFR Part 6. Reference to MEDEP Ch. 1000 will be added to the discussion of the Maine Wetlands Protection Rules (06-096 CMR Part 310).

7. **Comment:** 2.5, p. 2-17, 1st paragraph: "The area around Building 348 was not included..." See Comment 4 above.

   Response: The text will be revised to indicate the uncertainty in the western area including Building 348 and that a pre-design will be conducted to determine the appropriate boundary. Please see the Navy's response to MEDEP Comment No. 4.

8. **Comment:** 2.5, p. 2-17, last sentence: Change 1,6000 to 1,600.

   Response: The indicated error will be corrected.

9. **Comment:** 2.5, p. 2-18, 1st paragraph: "The area including the bedrock outcrop to the west..."

This text appears to contradict the later evaluation of remedial options (WDA-3 and WDA-4) that include removal and or consolidation of these pockets of soil into the main portion of the Waste Disposal Area. Please revise as needed, or simply note that they were not included in the volume calculations.

Response: The pockets of soil were included in the volume estimates. The text in Section 2.5 indicated that the pockets of soil in the bedrock outcrop is not included in the estimate will be deleted.

10. **Comment:** 2.5, p. 2-18 2nd paragraph: "Addressing the area contaminated with lead at concentrations greater than 4,000 mg/kg would likely result in exposure concentrations less than the construction worker PRG based on 60-day exposure..." Please clarify this statement. The table on p. 2-15 indicates that the 60-day construction worker PRG for lead is 2,000 mg/kg.

Response: The Navy appreciates the opportunity to clarify this point. As provided in Section 2.3, "The PRGs are the chemical-specific goals for representative site concentrations (based on the exposure concentration) that, when achieved, will result in site concentrations that pose an acceptable risk for the targeted receptor. PRGs have been developed on a receptor-specific basis for protection of human health from exposure to soil contaminants."

The remediation areas were developed so that remediation of the identified area would result in an exposure concentration equal to or less than the PRGs. There are a few isolated sample locations outside of the area delineated based on 4,000 mg/kg of lead that had concentrations greater than 2,000 mg/kg. Therefore, it is expected that remediating the soils within the area delineated based on 4,000 mg/kg would reduce the exposure concentration for lead to 2,000 mg/kg or less (i.e., less than the PRG based on 60-day construction worker exposure).

11. **Comment:** Table 2-1: In the OU1 Feasibility Study the chemical-specific ARARs included "Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, USEPA, Jan. 2003." Please include this in the OU2 ARARs table or explain why it is not included.

Response: The TRW reference will be added to Table 2-1.

12. **Comment:** Table 2-1, USEPA Region 9 PRGs: The reference should be to the updated September 2008 table.

Response: USEPA Region 9 PRGs (risk-based screening levels) were used in the risk assessment as screening levels and were included in the ARARs sections as TBCs. USEPA Regional Screening Levels (RSLs) are now being used as the risk screening levels, which are similar to the Region 9 PRGs. The text on Page 2-4 will be revised to indicate that in 2008, USEPA replaced region-specific risk-based screening levels (e.g., Region 9 PRGs) with RSLs. The USEPA risk-based screening levels were used as screening levels as part of the HHRA for OU2 and can be used to develop soil clean up goals. This information will also be provided in Table 2-1. This is consistent with the June 2010 Final Portsmouth OU1 FS Report. The most recent changes in RSLs did not include lead. Because the remediation areas are being driven by lead cleanup levels, it is not anticipated that the most recent change in RSLs will affect the remediation areas for OU2. However, the Navy will

evaluate whether the most recent change in the RSLs have affected the list of OU2 COCs and PRGs. Following this evaluation the Navy will confirm whether there are any changes to the remediation areas. The results will be provided in the Draft Final FS Report.

13. **Comment:** Table 2-2, Location-Specific ARARs: The OU3 ARARs table included the RCRA Floodplain Restrictions for Hazardous Waste Facilities, stating, "Remedial alternatives that involve construction in the 100-year floodplain would be designed, constructed, operated, and maintained to prevent washout of any hazardous waste by a 100-year flood and to result in no adverse effects on human health or the environment if washout were to occur." This should be included in the OU2 ARARs table.

    Response: Construction activities in the 100-year floodplain, within the OU2 shoreline area, are not anticipated as part of any alternatives for OU2. Therefore, the 100-year floodplain ARARs will not be added to these action specific ARARs tables. However because of the proximity of the construction zone to the Piscataqua River, emphasis on the erosion and sediment control ARARs have been added and are reflected in the revised Section 2.0 and Table 2-2 included in Attachment C to these responses to comments.

14. **Comment:** Table 2-3, p. 3/5: Maine Air Pollution Control Laws should be under State, not Federal, ARARs.

    Response: The indicated ARAR will be replaced by the Maine Visible Emissions Regulation (38 MRSA 584; 06-096 CMR 101) and included in Table 2-3 under State ARARs.

15. **Comment:** Table 3-1, p. 2/4: The screening comment for ex-situ chemical fixation should be the same as for in-situ chemical fixation but is not. Please clarify.

    Response: As a result of including the interim capped area within the limits of excavation for offsite disposal, ex-situ chemical fixation will not be retained. The main reason in-situ chemical fixation is eliminated is because of the difficulty to control the treatment within heterogeneous soil mixtures. The screening comments will be revised as follows:

    In-situ chemical fixation screening comment - "Eliminate because the use of this technology to reduce the mobility of contaminants or to prepare a surface barrier by in-situ application would be difficult to control due to the heterogeneous nature of the soil."

    Ex-situ chemical fixation screening comment – "Retain; the use of this technology could help to reduce the mobility of high lead concentrations in soil excavated from the interim capped area. This reduction in mobility would allow a potentially hazardous soil to be disposed as non-hazardous."

16. **Comment:** 3.5.2, p. 3-20: "The depth of waste and contaminated soils within the DRMO area extends 6 feet below ground surface…" MEDEP agrees with the statement in general but notes that there are locations at the DRMO (DSB-5, FCS-50, OU2-131) where the data indicate lead >1,000 mg/kg is found below 6 feet. The confirmation sampling proposed for any of the excavation alternatives could be applied to potential areas extending below 6 feet. Please revise the sentence to "The depth of *the majority* of waste and contaminated soils…" or similar to reflect the limited areas where contamination may extend below 6 feet.

    Response: The Navy concurs with the suggestion to add "the majority" to the text.

17. **Comment:** 4.2.2.1, p. 4-7, last sentence: LUCs are critical to the success of Alternative WDA-2. Therefore, verification of the continued effectiveness of LUCs should be on at least a quarterly basis in the beginning.

Response: The FS identifies the need for LUCs as part of any alternative that leaves contamination in-place. The text will be revised to indicate that frequency of inspection would be in accordance with the LUC RD. For costing purposes, the FS will be revised to indicate LUCs reviews would be conducted on an annual basis.

18. **Comment:** 4.2.7.2, p. 4-22, last sentence: "...there are no active treatment technologies to reduce contaminant toxicity, mobility, or volume associated with Alternative DRMO-3."

Soil washing/screening should reduce volume. As stated in p. 3-10, "The use of soil washing along with screening would yield clean material that could be used as backfill on site..."

Response: No changes to the FS are warranted. Screening and soil washing do not reduce contaminant volume or toxicity through treatment. These processes simply remove the contaminant that adheres to the smaller soil partials from the larger rock fragments. As a result, screening and soil washing allow you to remove the soil particles that contain the contamination rather than the larger rock that is not contaminated. The separated soil streams will still require handling as if they had not been screened or washed unless characterization samples indicate otherwise.

19. **Comment:** 4.2.8.1, p. 4-24: "...capping the portion of the DRMO area adjacent to Building 298 causing unacceptable industrial risk..." The highest concentrations of lead in soil at the DRMO are found at the southeast corner of Building 298 and must be removed.

Response: Decision to remove contaminated media based on unacceptable risks for a receptor are based on the exposure unit and not individual soil sample locations. Remedial option for capping would prevent unacceptable exposure to soil, and therefore, is a viable alternative for evaluation in the FS.

20. **Comment:** 4.2.8.2, Implementability, p. 4-27: This section states that Alternative DRMO-4 would require a significant amount of planning to implement. However, Alternative DRMO-3, which requires significantly more excavation, is considered "relatively simple to implement." Please explain this discrepancy.

Response: The Navy concurs that there is inconsistency in the description of implementability for these alternatives. However, the alternatives use the same technologies (excavation and off-site disposal) for implementation, so the amount of planning is similar as far as the physical remedial action portion of the alternatives is considered. With the newly revised alternatives discussed in Attachment B the only difference between the alternatives is the volume of soil excavated. Implementation of the alternatives will be revised to indicate volume and workspace are the two major components contributing to the implementation evaluation.

21. **Comment:** Table 5-2, p. 1: The table states that under Alternative DRMO-3 LUCs and O&M would not be required. The depth of excavation for this alternative is six feet although there are high levels of contamination in the soil deeper than six feet. As long as any contamination over unacceptable risk levels remain in the soil LUCs will be required to

ensure that contact with those contaminants do not occur. Likewise, LUCs will be necessary to prevent future potential contact with any contaminants below existing buildings.

Response: The Navy concurs that LUCs are necessary and Table 5-2 will be revised.

RESPONSES TO USEPA COMMENTS DATED MARCH 9, 2009
DRAFT FEASIBILITY STUDY REPORT FOR OPERABLE UNIT 2
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

1. **Comment:** Based upon review of this Feasibility Study there is concern relative to the Navy interpretation that ground water is not a medium of concern for risk.

   While ground water at Site 6 may not be a concern for drinking or dermal exposure during future construction activities, there is clearly potential for migration of suspended contaminants to the near/off shore Operable Unit 4. Assessment of ground water impacts cannot be dismissed if it is a source of contaminants for a down gradient receptor.

   This issue is of concern when conducting an analysis of remedial alternatives. There has been little consideration to lateral migration of contaminated fine grain material from OU 2 to the near/off shore environment. This has resulted in lack of inclusion of technologies or formulation of alternatives that consider this migration pathway. While there is one alternative provided in this feasibility study to replace the entire revetment along OU 2 (SL-3C-Sea Wall) it is not clear that the intended to be achieved from implementation of any of the shoreline stabilization alternatives is the prevention of potential fines migration.

   This feasibility study simply addresses the actions of waves on the OU 2 shoreline that can cause erosion and thus, transport of contaminated soils. According to EM 1110-2-1614 "Design of Coastal Revetments, Sea Walls, and Bulkheads" a revetment has to be designed and constructed to perform two functions. One is to prevent erosion from wave action, and the second is to prevent migration of fine grain particles through the revetment from the onshore side of the revetment. Without this filtering component there is potential for migration of contamination either as contamination in particulate form such as ash, or as contamination attached to fine grain size particles.

   That said, if this can be documented through existing design and "as-built" documents, this requirement could be satisfied. In any event, this contaminant migration pathway needs to be incorporated for evaluation into the feasibility study.

   Response: The Navy acknowledges USEPA concerns regarding migration of suspended fines from onshore OU2 to near/offshore OU4. Based on resolution of comments and revisions reflected in the March 2010 Final OU2 Supplemental RI Report and the July 2010 Draft OU4 FS Report, the Navy is proposing revisions to OU2 alternatives to address concerns for future potential migration. Data evaluation performed as part of the OU2 Supplemental RI Report demonstrates that migration of contaminants (dissolved and suspended) in groundwater under current site conditions do not result in unacceptable risk to the offshore and would not likely results in future risk based on the twice-daily flushing over 50 years or more since contamination was release at OU2 and the high rate of mixing in the offshore area. In addition, as discussed in the March 2010 Final OU2 Supplemental RI Report, August 2007 Final Additional Scrutiny Report for OU4, and February 2010 Final Interim Offshore Monitoring Program Rounds 1 through 10 Report for OU4, it was concluded that elevated concentrations of metals (copper, lead, and nickel) detected in sediment in the small intertidal area in MS-11 (located east of the OU2 shoreline) were likely from past erosion from OU2 (before erosion controls were placed in along the adjacent OU2 shoreline in 2005 and 2006), not from groundwater migration. Subsequent sediment sampling (as part of OU4 Interim Offshore Monitoring Rounds 8, 9, or 10 or as part of the OU2 Additional

Investigation) was not required because there is not sufficient amount of sediment located within MS-11 to cause an unacceptable risk to ecological receptors. Whether the lack of sediment at MS-11 is the result of mixing zones within the river or minimal migration of fines, there are no current unacceptable risks to human health or the environment in the sediment offshore of OU2. However, there is uncertainty for risks due to future migration from the area with an impermeable cap, if the cap is removed and high contamination remains in place. Future potential migration from unsaturated zone soil to groundwater in the capped area will be addressed by the addition of an RAO in the Draft Final OU2 FS Report. In addition, the remedial alternatives will be revised to include components to address the RAO as agreed to by the Navy, USEPA, and MEDEP. The revised alternatives are provided in Attachment B to these responses to comments. Revisions to reflect the March 2010 Final OU2 Supplemental RI Report were made to Section 1.0 for the Draft Final OU2 FS Report and are included in Attachment C to these responses to comments.

During resolution of comments on the September 2008 Draft OU2 Supplemental RI Report, the Navy indicated that implications relating to risk from the revetment design and construction are limited to erosion and transport of sediment to the off shore and that the Draft Final OU2 FS Report would address this issue. As provided in responses to comments on the September 2008 Draft OU2 Supplemental RI Report (see Appendix D.3 in the March 2010 Final OU2 Supplemental RI Report), the revetment was not designed to prevent migration of all fine-grained material to the offshore area, and as demonstrated by the groundwater, surface water, and sediment data and risk evaluation for OU4, the risk to the offshore is acceptable under current conditions. Based on risk evaluation conclusions provided in the March 2010 Final OU2 Supplemental RI Report, groundwater migration off site does not pose unacceptable risks based on current conditions and therefore there is no need to prevent particulate migration. However, it was agreed that there was uncertainty in the long-term stability and functioning of the shoreline controls. Because design documentation and "as-built" revetment documents are not available, a performance evaluation cannot be conducted on the existing revetment structures. A technical evaluation of the shoreline revetment was conducted and included as Section 2.9 in the March 2010 Final OU2 Supplemental RI Report. An RAO for future potential erosion and remedial alternatives to address this potential were already included in the November 2008 Revised Draft OU2 FS Report. During resolution of comments on the OU2 Supplemental RI Report, the Navy agreed to include inspection of the offshore area for sediment accumulation as part of shoreline inspections. For the Draft Final OU2 FS Report, this monitoring component for the shoreline controls will be added to LUCs component of DRMO and WDA alternatives, as provided in Attachment B to these responses to comments.

EM 1110-2-1614 states that structures (revetments, seawalls, and bulkheads) are often needed along shorelines to provide protection from wave action, or, to retain in situ soil or fill. A seawall is a massive structure that is designed primarily to resist wave action along high value coastal property. Bulkheads are retaining walls whose primary purpose is to hold or prevent the backfill from sliding while providing protection against light-to-moderate wave action. A revetment is a facing of erosion resistant material, such as stone or concrete, that is built to protect a scarp, embankment, or other shoreline features against erosion. Seawall and riprap extend along the shoreline to protect the WDA and Building 310. Revetments with pre-cast interlocking concrete blocks protect the shoreline by Building 298. Revetments with riprap protect the interim cap and the DRMO storage yard. Please refer to Figure 1-2 of the November 2008 Revised Draft OU2 FS Report.

There are many design factors to consider when selecting a shoreline structure, as well as,

both temporary and permanent potential environmental impacts from construction. Temporary impacts include turbidity, sedimentation, vegetation removal, and potential smothering of near-shore habitat. Permanent impacts may include changes to the shoreline adjacent to the project and ecological impacts to the river including hardening of the shoreline. Design factors and net environmental benefit will be evaluated along with potential unacceptable risk to human health and the environment when selecting alternatives. Based on the March 2010 Final OU2 Supplemental RI Report, revisions are proposed to Sections 1 and 2 and are provided in Attachment C to these responses to comments.

2. **Comment:** There is a noted inconsistency in the distribution of contaminant mass and how it is described has been presented in this feasibility study compared to the original OU 2 Feasibility Study prepared and published in 2004. Specifically, this feasibility study and the recent Supplemental Remedial Investigation Study provide figures that suggest relatively minor zones of contaminated materials exist beneath OU 2. The previous feasibility study published in 2004 and soil boring logs and soils contaminant analyses for the site clearly show significant contamination to depth beneath the OU 2 site. For example, areas now presented as "Surface Fill" and "Rock Fragment Fill" were previously presented as "dump fill, ash, wire, glass, metal, cinders, and wood".

   Response: Although the Navy recognizes that this comment was provided prior to the resolution of comments on the September 2008 Draft OU2 Supplemental RI Report, the Navy takes reservation with the implication that data have been disregarded in the Navy's interpretation of site conditions. With that said, in USEPA Comment No. 5 dated February 9, 2009 on the September 2008 Draft OU2 Supplemental RI Report, a similar comment on the cross sections was made. As provided in the Navy's response to USEPA Comment No. 5 on the September 2008 Draft OU2 Supplemental RI Report (included in Appendix D.1 of the March 2010 Final OU2 Supplemental RI Report), cross sections in the November 2004 Draft OU2 FS Report were updated after conducting the OU2 Additional Investigation in 2007 and 2008. The Additional Investigation included installation of approximately 100 soil borings, 2 test pits, and 5 groundwater monitoring wells, which provided a better understanding of geological conditions. The updated cross sections provided in the November 2008 Revised Draft OU2 FS Report were also provided in the September 2008 Draft OU2 Supplemental RI Report, and are consistent with the geological conditions at OU2. As part of resolution of USEPA's comment on the September 2008 Draft OU2 Supplemental RI Report, the Navy prepared additional cross sections with data from the boring logs and soil lead concentrations to show that the Navy's cross sections are accurate; however, text clarifications were made to provide additional description of the surface fill and rock fragment fill and the types of debris or waste materials identified within these zones. The text in Section 1.6.1.5 of the Draft Final OU2 FS Report will be revised to reflect the text clarifications made in the March 2010 final OU2 Supplemental RI Report. Attachment C to these responses to comments on the November 2008 Revised Draft OU2 FS Report includes the proposed text revisions for Section 1.6.1.5.

3. **Comment:** This feasibility study is lacking at least one additional remedial alternative that involves vertical as well as horizontal containment. Unless all contaminated materials down to the low tide incursion level beneath OU 2 are excavated, all of the remedial alternatives are not likely to result in the highest level of protection of human health and the environment. There will remain a significant potential for long term migration of contamination as suspended materials with the outgoing tide. Therefore, at least one

alternative must be included that fully recognizes this potential and specifically includes a vertical barrier.

Response: Please see the Navy's response to USEPA Comment No. 1 related to risks from contaminant migration to the off shore. The Navy believes that the revisions to alternatives based on resolution of comments on the OU2 Supplemental RI Report and the agreement to include inspection and monitoring address USEPA concern for future potential migration. Further, as discussed during resolution of comments on the OU2 Supplemental RI Report, uncertainties related to future potential migration do not warrant evaluation of a vertical containment option in the Draft Final OU2 FS Report.

Specific Comments

1. **Comment:** *Page ES-1, 2nd Paragraph, 6th Sentence:* The conclusion that there is no risk from ground water is not concurred with. Contrary to the reference to the Supplemental Remedial Investigation supporting that interpretation, there has not been any recent sampling of near/off shore sediments. Past sampling prior to limited remedial actions has indicated the presence of elevated and increasing trends of lead. While dissolved phase metals may not have been detected in significant concentrations, there has not been an evaluation of transport as suspended concentrations with likely subsequent deposition to sediments along the Operable Unit 4 shoreline.

   The materials previously described in Site 6 subsurface soils have the potential to migrate to the near-off shore area if an adequate filter is not a component of the revetment along the Site 6 embankment. Further, where these materials exist over zones of "rock fragments" there is the tendency to migrate vertically downward over time. This will provide a potential constant supply of contaminated fine grain material for transport in the suspended form, if not in the dissolved form. This is especially likely given the exchanges of tidal water and resulting turbulent conditions in the "rock fragment fill". Unless these fine grain materials are adequately filtered, they can contribute to near/off shore contamination.

   In addition to previous (2004 Feasibility Study, OU 2) figures as well as soil boring logs indicating the presence of fine grain material, inspection of the Treatability Studies indicates that significant percentages of fine grain material exist. For the study conducted in 2006 (Appendix E1) Table 2-4 shows significant fractions of soil with grain size smaller than fine sand (0.40 mm). The average "as received" percentage of soils less than 0.50 mm in diameter was 19%. The average "as received" percentage of silt/clay fraction (less than 0.075 mm) was 7%. These results indicate potential for migration of fines both downward into the coarser intervals and migration through the revetment if an adequate filter system is not in place.

   Response: Please see the Navy's response to USEPA Comment No. 1 for information regarding risks from groundwater and USEPA concerns regarding migration of suspended fines from onshore OU2 to near/offshore OU4. The referenced text will be revised based on the resolution of comments and revisions reflected in the March 2010 Final OU2 Supplemental RI Report.

2. **Comment:** *Page ES-2, 2nd Bullet:* The conclusion that ground water will not impact down gradient near-off shore locations is not concurred with. While lead is poorly soluble in water the permeability of the subsurface materials and the magnitude of tidal (ground water) fluctuations into and out of the site provide a potential mechanism for migration of

contaminants absorbed to fine grain soil particles. It has not been documented that the existing revetment along the Site 6 embankment has a filter designed to prevent migration and transport of these particles.

Response: As a result of the technical meetings held and the resolution of comments on the September 2008 Draft OU2 Supplemental RI Report, the USEPA concurred with the Navy that there are no current risks from groundwater and the Navy concurred with the USEPA that there is uncertainty with the potential for future groundwater risk. The referenced text will be revised based on the resolution of comments and revisions reflected in the March 2010 Final OU2 Supplemental RI Report. Please see the Navy's response to USEPA Comment No. 1 for additional information on resolution of this issue and proposed revisions for the Draft Final OU2 FS Report.

3. **Comment:** *Page ES-2, 3rd Bullet:* The statement that contaminated sediments are derived from erosion along the shoreline is not supported. As noted in EM 1110-2-1614 "Design of Coastal Revetments, Sea Walls, and Bulkheads" a well designed filter is needed to prevent migration of fine soil particles through the revetment. EPA believes that the Site 6 revetment was designed absent a filter.

It is also not clear what is meant by "evaluation of the off shore data". Previous data has shown an increasing trend in lead in sediments. While remedial actions were subsequently conducted, review of the OU 2 Additional Scrutiny Report and the Supplemental Remedial Investigation Report indicates that there does not appear to have been any post remedial sediment sampling conducted.

Response: As indicated in EM 1110-2-1901 and EM 1110-2-2300 filter layers are meant to minimize the migration of fine soil particulates through a revetment. These documents indicate that revetments are shore-parallel structures built on a slope, typically from layers of stone with increasing size from the land towards the water. A typical revetment has at least two distinct layers – an underlayer and armor layer, each at least two stone diameters thick, placed on top of a geotextile fabric to minimize the migration of fines through the structure. Both layers are sized for stability in the design wave climate and to limit the structure porosity. A key element in the construction of a revetment is the placement of the armor layer, which must be done piece by piece, with verification of interlocking and at least three points of contact. The voids between the stones must be maintained (not concreted or filled with smaller stone) to allow for wave energy to "bounce around" between the stone and for the structure to be able to "self heal" in the case of damage to one area. If a stone is removed from a certain area, the adjacent stones tend to collapse into the void and maintain the functionality of the revetment until repairs can be made.

A filter is a transitional layer of gravel, small stone, or fabric placed between the underlying soil and the structure. The filter limits migration of the fine soil particles through voids in the structure, distributes the weight of the armor units to provide more uniform settlement, and permits relief of hydrostatic pressures within the soils. For areas above the waterline, filters also prevent surface water from causing erosion (gullies) beneath the riprap. Specific design guidance for gravel and stone filters is contained in EM 1110-2-1901 and EM 1110-2-2300 and guidance for cloth filters is contained in CW 02215.

Please also refer to the Navy's response to USEPA Comment No.1 for changes to the FS to address potential for fine soil particle migration through the revetment structure.

4. **Comment:** *Page ES-2, 4th Bullet:* The risk assessment has not demonstrated that there is no risk due to migration of ground water. While the Supplemental Remedial Investigation did not result in detection of elevated metals dissolved in the near-off shore surface water there has been no assessment of potential transport of contaminants absorbed to fine soil particles through the revetment.

   For Site 6 the Supplemental Remedial Investigation (Figure 3-2) indicated elevated total copper and lead in near shore monitoring wells DW-6 and DW-7S while nickel is present in the dissolved phase for several near shore wells. For Site 29 elevated lead and copper was detected at DW-8. While a new revetment of limited extent was recently constructed at Site 29 which did include a filter fabric, the Supplemental Remedial Investigation still resulted in the detection of total copper in SW-06

   Response: Please see the Navy's responses to USEPA Comment No. 1 and USEPA Specific Comment No. 2.

5. **Comment:** *Page ES-2, Item No. 2:* It does not appear that the intent to prevent erosion of Soils from OU 2 to the near-off shore environment includes prevention of migration of fine grain particles potentially carrying contaminants is included in this feasibility study. The prevention discussed in this feasibility study appears to be focused solely on potential erosion of the embankment soils due to wave action. Prevention of migration of particles through the revetment is also needed.

   Response: Please see the Navy's response to USEPA Comment No. 1.

6. **Comment:** *Page ES.3, Last Paragraph:* It is not clear from this feasibility study that the goal of protection of the environment will be met. The alternatives developed do not appear to consider the potential for migration of fine grain materials carrying contamination that could migrate through the revetment to the near-off shore.

   Response: Please see the Navy's response to USEPA Comment No. 1.

7. **Comment:** *Page ES-6, 1st Paragraph, 1st Sentence:* EPA does not concur with the statement that the shoreline stabilization measures are not a component of OU 2 remediation. Because of the potential for transport of contaminated soil particles with tidal cycles, including continual generation of these particles due to settlement, tidal action, etc. containment of this contamination must be considered when evaluating remedial alternatives. Without verification of an engineered filter already in place (i.e. along the Site 6 revetment), and considering that all contaminated soils are not proposed for excavation, there is potential for continued migration of contaminants as suspended materials over time.

   Response: Based on resolution of comments on the September 2008 Draft OU2 Supplemental RI Report related to potential future erosion, the alternatives in the Draft Final OU2 FS Report will be revised to address potential future erosion through LUCs and structural components of WDA and DRMO alternatives. Separate shoreline stabilization alternatives (SL-1, SL-2, and SL-3) will not be included in the Draft Final OU2 FS Report. Please also see the Navy's responses to USEPA Comment No. 1 and USEPA Specific Comment No. 2.

8. **Comment:** *Page ES-6, 1st Paragraph, 2nd through 4th Sentences:* It has not been demonstrated that the existing shoreline stabilization measures Alternative SL-1 and SL2

are currently "operating effectively". This assessment appears to be based on wave action erosion only.

Response: Please see the Navy's response to USEPA Comment No. 1.

9. **Comment:** *Page 1-7. 6th Paragraph:* It should be noted that the emergency actions implemented to "cover eroding soils" following the initial construction of the revetment may have been necessary due to migration of soils from the revetment. This is a major mechanism for erosion and failure of revetments in addition to that of wave action.

   Response: The Navy disagrees with the need to note that the migration of fines may have been the reason for the revetment updates. The existing shoreline stabilization revetment was placed along Site 6 and Site 29 to allow this area to be used as it is today. Subsequent findings of contamination within the soil behind the shoreline stabilization structures have lead to the agreement that these shoreline stabilization structures are also important for the protection of the offshore area from migrating contamination. The need for the more recent upgrade of the original stabilization structures was determined to be a result of soils eroding from the top of the shoreline. Alterations were performed to a portion of the revetment (east of Site 6 and west of the seawall at Site 29) because of the steep slope at which the revetment was constructed. No voids were found below the revetment stone indicating that the migration of fines through the revetment was not the reason for the most recent revetment repairs.

10. **Comment:** *Page 1-10, 2nd Paragraph, last Sentence:* The stated protectiveness of the current slope stabilization measures is unsupported by sampling.

    Response: The referenced paragraph provides the conclusion of the August 2007 Final Additional Scrutiny Report for OU4. Although the Navy recommended combining onshore and offshore impacts at all Shipyard IRP sites, sampling required to monitor sediment offshore of OU2 is being monitored as part of the OU4 Interim Offshore Monitoring Program (October 1999 Final Plan and June 2010 Draft Plan Update) and addressed as part of the July 2010 Draft OU4 FS Report. The Draft OU4 FS Report evaluates MNR for the offshore area of OU2, identified as MS-11. Under current conditions concentrations of one or more COCs exceed PRGs. However, there is not a sufficient amount of sediment located within MS-11 to cause an unacceptable risk to ecological receptors. Whether the lack of sediment for sampling is the result of mixing zones within the river or minimal migration of fines, there are no current unacceptable risks to human health or the environment in the sediment offshore of OU2. As discussed in the referenced text, sampling as part of the Interim Offshore Monitoring Program indicate an insufficient amount of sediment offshore of OU2 to warrant collection of samples. Please also see the Navy's response to USEPA Comment No. 1.

11. **Comment:** *Page 1-10, last Paragraph, 5th Sentence:* It is unlikely that lead contamination in soils in the residential area is due to house painting given the documented nature of storage activities at OU 2.

    Response: Regardless of the uncertainty regarding the source of lead-contaminated soil, the Navy, with concurrence of the USEPA and support agency, is conducting a non-time critical removal action in the vicinity of Quarters S and N. An Engineering Evaluation/Cost Analysis (EE/CA), Action Memorandum, Removal Action Work Plan, and Removal Action Report will be prepared to support the removal action for the DRMO Impact Area.

12. **Comment:** *Page 1-10, Last Sentence:* See Specific Comment 10.

Response: Please see the Navy's responses to USEPA Comment No. 1 and USEPA Specific Comment No. 10.

13. **Comment:** *Page 1-16, Last Sentence:* The statement that, in effect, because lead was found in an area not associated with DRMO source area means that it was derived from other sources such as house painting is not concurred with. In particular, it should be noted that transport of lead contaminated soil particles can and does occur through the effects of wind. Given the extensive use of OU 2 for disposal and storage of materials containing lead, it is highly probable that the detected lead in soils originated from OU 2. Dismissal as originated from other relatively minor likely contributory sources is not appropriate.

Response: Please see the Navy's response to USEPA Specific Comment No. 11.

14. **Comment:** *Page 1-17, 1st Paragraph:* See Specific Comment 13.

Response: Please see the Navy's response to USEPA Specific Comment No. 13.

15. **Comment:** *Page 1-17, 3rd Paragraph:* The statements in this paragraph underscore concerns regarding the potential for migration of fine grain soil particles containing absorbed contaminants to near-off shore areas through the revetments if those revetments are not adequately designed and constructed to filter those particles from the ground water. That is, migration of contaminants is not through the dissolved phase in ground water only.

Response: Please see the Navy's response to USEPA Comment No. 1.

16. **Comment:** *Page 1-17, 4th Paragraph, last Sentence:* There has been no near/off shore sediment sampling to support the statement made in this sentence.

Response: The referenced text is the first sentence of Section 1.6.3, which provides a summary of the evaluation of fate and transport of contaminants conducted as part of the OU2 Supplemental RI (see Section 4.0 in the March 2010 Final OU2 Supplemental RI Report). Sediment sampling at MS-11 (Location 8) was conducted as part of the Interim Offshore Monitoring Program (Rounds 1 to 7). Please see Section 4.0 and Appendix A of the March 2010 Final OU2 Supplemental RI Report for additional information on how the sediment data were evaluated as part of the fate and transport evaluation and for sediment data for MS-11, respectively.

17. **Comment:** *Page 1-17, Last Paragraph:* There has been no assessment to support the interpretation that there is no transport of particulate matter containing contamination in outgoing tidal ground water. The modeling that has been conducted appears to have been based on dissolved phase metals only.

Response: Please see the Navy's response to USEPA Comment No. 1.

18. **Comment:** *Page 1-19, 1st Paragraph, 3rd Sentence:* There has been no recent sampling of sediment, albeit "limited and between rocks" to support this interpretation.

Response: Please see the Navy's response to USEPA Comment No. 1.

19. **Comment:** *Page 1-19, 2nd Paragraph, Last Sentence:* It has not been demonstrated that migration of ground water off site does not pose unacceptable risks for OU 2.

    Response: Please see the Navy's response to USEPA Comment No. 1.

20. **Comment:** *Page 1-19, 3rd Paragraph:* It has not been demonstrated that ground water is not a medium of concern for OU 2 in regard to transport of contaminants to near-off shore areas.

    Response: Please see the Navy's response to USEPA Comment No. 1.

21. **Comment:** *Page 1-20, 3rd Bullet:* This assessment appears to have focused on the migration of dissolved phase metals only. It has not been demonstrated that migration of metals absorbed to fine particulate matter does not occur.

    Response: The assessment considered dissolved and suspended contaminants. Please see the Navy's response to USEPA Comment No. 1.

22. **Comment:** *Page 1-20, 4th Bullet:* This assessment appears to be subjective. Previous sampling has shown that elevated concentrations of lead following an increasing trend were present in the near-off shore environment. Subsequent to any removal actions that have been performed there has been no additional follow up confirmatory sediment sampling conducted. As such, the statement made is not supportable by data.

    Response: Please see the Navy's response to USEPA Comment No. 1.

23. **Comment:** *Page 2-13, Section 2.2:* Given the potential for migration of fine grain soil particles to the near-off shore environment through the existing shoreline stabilization structures, ground water also should be considered as a medium of concern, unless it can be demonstrated that the existing shoreline stabilization measures effectively prevent migration of fine grain material through the revetments.

    Response: Please see the Navy's response to USEPA Comment No. 1.

24. **Comment:** *Page 2-14, Item No. 2:* The protection or the off shore environment cannot be achieved by consideration of erosion of the OU 2 soils by wave action alone. The feasibility study has to include either a robust documentation of the current effectiveness of the shoreline stabilization measures to prevent migration of fine grain material through the revetment or consider this as a specific objective in the formulation of remedial alternatives for shoreline stabilization. This does not appear to have been done in this feasibility study.

    Response: Please see the Navy's response to USEPA Comment No. 1.

25. **Comment:** *Page 2-15. 3rd Paragraph, Last Sentence:* What is the rational for providing two durations for construction worker exposure? It would appear that a worse case duration should be considered, or at a minimum, the focus should be on the 60 day duration if it is believed that this duration is potentially likely.

    Further, how does this relate to the possible construction activities of the shoreline

stabilization measures? For Alternative SL-3C, it would appear that the duration of exposure would potentially be longer than 60 days. Since implementation of this alternative is potentially feasible a likely longer duration of time should be evaluated rather than the 60 days.

Response: The text will be clarified that construction work is expected to be less than 60 days and a PRG for lead based on 60-day exposure (2,000 mg/kg) will be used as the PRG for OU2.

PRGs are based on site exposure concentrations that need to be met after remediation; therefore, durations for remediation work are not considered in the PRG development. Remediation work will follow the appropriate health and safety requirements for the remediation. (i.e., PRG is to protect general worker and not remediation worker).

26. **Comment:** *Figure 2-3:* Why does the area of "unacceptable risk – construction worker" not include the shoreline protection areas? It would appear that if remedial alternative SL-3A-C was to be implemented this would be a concern.

Response: Please see the Navy's response to USEPA Specific Comment No. 25. A construction worker performing utility work most likely would not be exposed to the soil under the shoreline revetment. Remediation work is not considered as part of the construction worker exposure risk assessment. Remedial action contractors follow the appropriate health and safety requirements when conducting remediation work.

27. **Comment:** *Page 3-4, Retained Option for Soil Stabilization:* Containment should include a vertical barrier to prevent horizontal migration of contaminated soil through the revetment.

Response: As indicated in the responses to USEPA Comment Nos. 1 and 3, the Navy recognizes the uncertainty associated with the revetment structure and will add components to the remedial alternatives within the FS to address the uncertainty. The revised remedial alternatives will include the monitoring of existing shoreline stabilization structures under LUCs. The specific alternatives addressing the shoreline stabilization, including technology screening for shoreline stabilization, have been removed from the text. The Navy does not see the shoreline stabilization structures as a component of the OU2 remedy. Rather the Navy sees the shoreline stabilization structures as needed to protect the integrity of the proposed remedies.

28. **Comment:** *Page 3-4, Retained Option for Soil Stabilization:* Containment should have been included on this table. Installation of a vertical barrier using sheet piling would prevent migration of contaminated soil through the revetment. The current focus appears to address shoreline erosion from wave action only.

Response: A vertical barrier will be added to Table 3-1 (the preliminary technology screening table). There are numerous design considerations to evaluate to retain this technology as a component to a viable alternative. Due to the presence of blast rock, the sheet piling cannot be advanced with control of location, to provide a vertical barrier below the depth of the fine grained material present above the blast rock, which is at an average depth of 6 feet below ground surface. Sheet piling will be screened out in Table 3-1 because implementability issues and because there are no current risks associated with the migration of contamination through the existing revetment. Monitoring of existing shoreline stabilization features have been added to the LUCs component of each remedial action

alternative. As indicated in the Navy's response to USEPA Specific Comment No. 27, the specific shoreline stabilization alternatives will be removed from the text.

29. **Comment:** *Page 3-6, Section 3.3.3: See Specific Comments 27 and 28.*

Response: Please see the Navy's responses to USEPA Specific Comments Nos. 27 and 28.

30. **Comment:** *Page 3-10, 1st Paragraph, 2nd Sentence:* This sentence underscores GF-CDW concerns for migration of contaminants with fine grain materials. These fine grain materials which exist in significant percentages as documented by the treatability study results. These materials even if found initially at the shallower intervals will migrate vertically into the deeper intervals of the more coarse fill, etc. This downward vertical migration has been documented by analytical results provided in analytical tables of the Supplemental Remedial Investigation Report.

Response: Please see the Navy's response to USEPA Comment No. 1.

31. **Comment:** *Page 3-14, Section 3.4.3:* Revetments should also be designed to prevent migration of fine grain soils from the onshore location of the revetment.

Response: Revetments should be designed to minimize the migration of fines. However as indicated in the Navy's response to USEPA Specific Comment No. 27 shoreline stabilization alternatives are being removed from the FS and addressed in the LUCs of the remedial alternatives. As a result of this change Section 3.4 of the November 2008 Draft FS will be removed.

32. **Comment:** Page 3-14, Section 3.4.3.1: The description of revetments is correct in noting the need for a filter layer. However, to date, there has been no submission of either design information or "as built" documents that provide verification that an adequate filter layer exists for the revetment along Site 6.

Response: Please see the Navy's response to USEPA Comment No. 1. A technical evaluation of the shoreline revetment was included in the March 2010 Final OU2 Supplemental RI Report. Also as provided in the Navy's response to USEPA Specific Comment No. 27, shoreline stabilization alternatives will be removed from the FS, and replaced with monitoring as part of LUCs.

33. **Comment:** *Page 3-18, Section 3.5:* Inclusion of a vertical barrier for purposes of soil containment should be included. This function may be achieved by an appropriately designed shoreline stabilization measure.

Response: Please see the Navy's responses to USEPA Comment No. 1 and USEPA Specific Comment Nos. 27 and 28.

34. **Comment:** *Page 3-20, 1st Paragraph, 3rd Sentence:* Review of the data indicates that the depth of waste and contaminated soil extends deeper than 6 feet below the ground surface in the DRMO area. If there is a limitation it appears to be that many of the samples collected in the DRMO area extended only to 2 feet below the ground surface.

Descriptions in the soil boring logs and figures provided in the 2004 Feasibility Study for OU

2 shows waste extending to at least 10 feet below ground surface (DSB-2, DSB-6C, DSB-7DB, FCS-50, 29SB-14) and 15 feet below ground surface (DSB-7, DSB-7D, FCS-48, FCS-51). The location of FCS-51 and FCS-52 had elevated lead at depths of 16 feet below ground surface with elevated nickel present at 20 feet for FCS-51.

Response: The determination on excavation depth is based on the latest information generated during the 2007 Additional Investigation in addition to the information presented in the November 2004 Draft OU2 FS Report. Most of the borings in the DRMO extend to 6 feet bgs or deeper based on the collection of data in 2007 as part of the OU2 Additional Investigation. Contaminated soil was found at shallower and deeper depths; however, the average depth of contaminated soil was estimated to be 6 feet bgs. The November 2004 Draft OU2 FS Report referenced in this comment was updated in November 2008 (Revised Draft OU2 FS Report) based on the information from the OU2 Additional Investigation and the September 2008 Draft OU2 Supplemental RI Report. Please also see the Navy's response to USEPA Comment No. 2.

35. **Comment:** *Page 3-20, 2nd Paragraph:* An additional bullet should be provided with vertical containment to prevent lateral migration of contaminated fine grain particles.

Response: Please see the Navy's responses to USEPA Comment Nos. 1 and 3 and USEPA Specific Comment No. 28.

36. **Comment:** *Table 3-1, Page 1:* A "vertical barrier" remedial technology should also be included in this table. This technology is needed to complete the "containment" approach to prevent potential horizontal migration of contaminated particles with the tidal cycles through the revetment unless it can be demonstrated that the revetment (either in place or with upgrade) will provide effective filtration.

Response: Please see Navy's responses to USEPA Comment No. 1 and USEPA Specific Comment No. 28.

37. **Comment:** *Table 3-1, Page 1:* What is the purpose of including "Biological Treatment" in this table and the screening process if it is known to be inapplicable for lead?

Response: No changes to Table 3-1 are warranted. Table 3-1 is a preliminary screening of technologies conducted to identify publically available technologies and innovative technologies that are known environmental remedial technologies and show which technologies were eliminated and retained for further evaluation in the next step of technology evaluation (see Section 3.3). The preliminary screening of technologies is consistent with the screening step described in the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (EPA, October 1988).

38. **Comment:** *Table 3-1, Page 2:* It is unclear why "Dynamic Underground Stripping", "Soil Vapor Extraction" and "Vitrification and Radio Frequency Heating" were included in this table if there were not applicable to the contaminants of concern. Technologies should not be included when it is obvious at the beginning that they are not suitable for the site. Similarly, the rational for eliminating "Chemical Fixation/Solidification" is not clear.

Response: Please see the Navy's response to USEPA Specific Comment No. 37 regarding technologies not applicable to the contaminants of concern. Please see the Navy's response to MEDEP Comment No. 15 for text clarifications for eliminating in-situ Chemical

Fixation/Solidification and retaining ex-situ Chemical Fixation/Solidification.

39. **Comment:** *Table 3-1, Page 3:* Again, it is entirely unclear why many of the Ex Situ Treatment technologies listed were even included given that they are clearly inappropriate for the contaminants of concern, i.e. metals.

    Response: Please see the Navy's response to USEPA Specific Comment No. 37.

40. **Comment:** *Table 3-2, Page 1:* The description of process option for "Rip Rap Revetment" is of concern. It suggests that all this is needed for an effective revetment is placement of a layer of rock. This is not an accurate description of a viable, engineered revetment. All revetments require an engineered filter layer. Further, if the description provided applies to the existing revetment adjacent to Site 6 then that revetment is inadequate to prevent lateral migration of fine grain materials to the near shore environment with tidal cycles.

    Response: The Navy concurs that there is more to an effective revetment than the placement of a layer of rock. In addition the Navy agrees that a shoreline revetment contains elements that resist the erosive forces associated with the shoreline and provide filtration to minimize the migration of fines to offshore areas. However, with the removal of shoreline stabilization alternatives from the FS as indicated in the Navy's response to USEPA Specific Comment No. 27, Table 3-2 has also been removed from the text.

41. **Comment:** *Table 3-2: Page 1:* A modified "Bulkhead" should be included as an additional technology/process option should be included. This would consist of driving sheet piling behind the existing revetment at Site 6. The existing rip rap would be left in place. The purpose would be to prevent migration of contaminated fine grain material from the site.

    Response: Please refer to the Navy's responses to USEPA Specific Comment Nos. 27 and 40.

42. **Comment:** *Table 3-2, Page 2:* Given the knowledge of the site what is the purpose of even including "Off Shore Erosion Controls" especially since all were eliminated?

    Response: Please see the Navy's response to USEPA Specific Comment No. 37 regarding screening of technologies. Please refer to Navy's responses to USEPA Specific Comment Nos. 27 and 40 regarding the removal of Table 3-2 from the FS.

43. **Comment:** *Figure 3-2:* This figure is somewhat misleading. It shows DSB-8 as part of the cross section when Figure 3-1 shows cross section A-A' extending to DSB-9 only. Also, he depiction of "Surface Fill" and "Rock Fill" give the impression that these areas are relatively clean. This is not what is interpreted when reviewing the soil boring and analytical data for the Site 29 area. Cross Section C-C' of the 2004 Feasibility Study for OU-2 which lies approximately along the line of A-A' shows "sand, cinders, dump fill" extending to 12 feet at 298SB05 and to 9 feet at TPI-SB-01.

    Response: Cross sections A-A' and B-B' in the FS Report are the same as cross sections D-D' and B-B' in the RI Report, respectively. Information from boring DSB-8 was projected on to cross section A-A' as indicated by the dashed lines, to provide information for the area between OU2-113 and DSB-9. The cross section figures in Section 3.0 of the November 2008 Revised Draft OU2 FS Report will be replaced with the revised cross sections provided in Section 2.0 in the March 2010 Final OU2 Supplemental RI Report.

The Navy's interpretation of soil boring and analytical data for the Site 29 area as shown on the cross section in the November 2008 Revised Draft OU2 FS Report is consistent with the March 2010 Final OU2 Supplemental RI Report. Please see the Navy's response to USEPA Comment No. 2 for information on resolution of USEPA's similar concern on the September 2008 Draft OU2 Supplemental RI Report.

44. **Comment:** *Figure 3-3:* Why was this location chosen as a "representative" cross section? It appears to lie at the boundary of the affected Site 6 and Site 29 areas?

Response: Figure 3-3 was chosen as a representative cross section for the DRMO area as it crosses the DRMO area, including the capped area. It illustrates conditions that are typically found in the DRMO area. For additional information, cross section C-C' from the March 2010 OU2 Supplemental RI Report will also be presented to show information regarding the shoreline/revetment. This cross section is perpendicular to cross section B-B'.

45. **Comment:** *Figure 3-4:* As with Figure 3-2 this figure is somewhat misleading. It conveys the impression that Site 6 consists essentially of clean "Surface Fill" and "Rock Fill" when the data indicates otherwise. See Specific Comment 34.

Response: The interpretation of geological conditions on Figure 3-4 is correct. Please see the Navy's responses to USEPA Comment No. 2 and USEPA Specific Comment Nos. 34 and 43.

46. **Comment:** *Page 4-4, Section 4.1.2:* Unless it can be demonstrated that there will be no lateral migration of contaminants from the OU 2 area, the first threshold criteria: "Overall Protection of Human Health and the Environment" cannot be met. Merely discussing revetments and referencing existing revetments at Site 6 does not satisfy this requirement.

Response: Please see the Navy's response to USEPA Comment No. 1. The alternatives will be revised to meet the RAO that addresses the future potential migration of contaminants from unsaturated zone soil to groundwater in the capped area that may result in unacceptable risk to the offshore.

47. **Comment:** *Page 4-5, Section 4.2:* There is no alternative provided for either of the two sites that addresses potential for lateral migration of contaminants with tidal cycles. While there are alternatives provided for shoreline protection those alternatives focus on erosion of the shoreline by wave action and do not address the potential of lateral migration of contaminated fine grain material from the site with tidal flushing. Continued shifting and settlement of soil materials in the proximity of coarse fill, i.e. "rock fragments" is likely to provide long term downward vertical soil migration. This is especially likely since there is no engineering filter to prevent such downward vertical migration of fine grain materials.

For the WDA Alternatives, two are described as having a "cap" as a component. Yet, in the text for the WDA and DRMO alternatives, a distinction is made between a "cap" and a "cover" system. Therefore, the descriptions for Alternatives WDA-3 and WDA-4 should be changed to reflect that a "cover" will be implemented as a part of that alternative.

Response: As provided in the Navy's response to USEPA Comment No.1, components will be added to the alternatives to address this concern for lateral migration through the revetment.

For the WDA Alternatives the text will be revised to identify the components of the WDA alternatives as covers rather than caps.

48. **Comment:** *Page 4-10, Alternative WDA-3:* The rational for placement of a soil cover in this area is not understood when reviewing the rational for placement of a cap system as described for Alternative DRMO 5 below. Under that alternative, it is stated that contaminated soils exist above the ground water table. It is interpreted that this creates a concern for downward migration of contaminants under the influence of infiltration of precipitation. Inspection of the site data shows that contaminated soils exist in the waste disposal area above the ground water table as well. Therefore, it would appear that a cap, rather than a cover system, is applicable for this location also.

Response: The Navy agrees that there is some waste above the groundwater table within the limits of the WDA. However, the majority of the WDA waste is located at depths that are in constant contact with the groundwater and within the tidal zone. Based on the number of years that this material has been in place and that there are no current risks from groundwater migration (see the Navy's response to USEPA Comment No. 1), a cover system with monitoring is an adequate remedy for the WDA area.

49. **Comment:** *Page 4-13, Alternative WDA-4:* While the top 2 feet of soil would be removed there would still be a significant thickness of contaminated soils above the ground water table at this location. Therefore, a cap rather than a cover system appears to be warranted. See Specific Comment 48.

Response: Please see the Navy's response to USEPA Specific Comment No. 48.

50. **Comment:** *Pages 4-23 and 4-27, "Implementability":* The discussion of the effort required to implement the excavation alternatives is not consistent. On Page 4-23 it is noted that "Alternative DRMO 3 would be relatively simple to implement". It also just notes that staging will be required so as to not interrupt ongoing site activities. However, on Page 4-27 it is noted that "Alternative DRMO 4 would require a significant amount of planning to implement". Since Alternative DRMO 4 requires less soil excavation, it would appear that this alternative should be easier to implement. Further, based upon the discussion for Alternative DRMO 3, it would appear that excavation actually can be implemented without excess difficulty.

Response: The implementability discussion on all alternatives will be revised to reflect the current usage of the area and the need to perform alternatives without disrupting the activities of the Shipyard in these areas. Please see the Navy's response to MEDEP Comment No. 20 for additional information regarding revision to the text.

51. **Comment:** *Page 4-29, 1st Paragraph:* The rational for a cap system rather than a cover system is not followed. First, contamination at both sites is located above the ground water table. If it were not, then there would not likely be a need for a cover system where it is currently in place and proposed under the waste disposal area alternatives to address risks. Second, the intent to place a cap system over areas of the DRMO appears to acknowledge the need to prevent infiltration and further migration of contaminants vertically downward. It also suggests that placement of a cover system is not adequate for the waste disposal area. While there is likely downward vertical migration of soil particles from shallower intervals without infiltration, i.e. due to shifting soils overlying "rock fragment" fill, infiltration of

precipitation is likely to exacerbate this problem.

Response: Based on the revisions to the remedial alternatives that will be evaluated in the Draft Final OU2 FS Report, the only alternative that includes a cap is an alternative that replaces the existing interim impermeable cap. A cap rather than a cover is proposed for this area because of the lead concentrations (greater than 10,000 mg/kg) found in the overburden soil in this area. These concentrations as likely to leach to the groundwater if the area is not addressed by complete removal of the contaminants or installation of an impermeable cap. The WDA contains minimal contamination within the overburden soil and the majority of the contamination and waste are located within the groundwater. The contamination has been in contact with groundwater over 50 years and groundwater data show that there are no unacceptable risks for groundwater. Therefore, it is considered unlikely that contamination in the WDA would leach in the future at levels that would cause an unacceptable risk. As a result a permeable soil cover has been proposed for the WDA area. However, because contamination will be left in the place for some of the WDA alternatives, groundwater monitoring is included in these WDA alternatives.

52. **Comment:** *Page 4-31, Section 4.3, 1st Paragraph:* It has not yet been demonstrated that the current shoreline stabilization structures are effectively preventing erosion and transport of soils from within the OU 2 site to the near/off shore environment.

Response: As indicated in the Navy's response to the USEPA Specific Comment No. 27, the shoreline stabilization alternatives are being removed from the FS and the monitoring of the existing shoreline stabilization alternatives are being added to the LUCs to be more consistent with OU1. As a result Section 4.3 is being removed from the FS.

53. **Comment:** *Page 4-34, Section 4.3.3.1, 1st Paragraph, 2nd Sentence:* The discussion of implementation of shoreline upgrades being dependent upon a future inspection is vague. This statement suggests that Alternative SL-2, Monitoring and Maintenance of Existing Structures" will be selected and maybe, in the future some additional work will be performed.

Response: Please refer to the Navy's responses to USEPA Comment No. 1 and USEPA Specific Comment No. 27. The discussion on future shoreline upgrades and future shoreline inspections will be addressed as part of LUCs.

54. **Comment:** *Page 4-34, Section 4.3.3.2:* This section provides no analysis of the effectiveness of the existing structures to prevent lateral migration of fine grain material through the existing revetments and seawall. As such, it cannot be assumed that the existing revetments and seawall are adequate for implementation of Alternative SL-2.

Response: Please see the Navy's responses to USEPA Comment No. 1 and USEPA Specific Comment No. 27. The shoreline stabilization alternatives will not be included in the Draft Final OU2 FS Report; the effectiveness of the shoreline stabilization features will be monitored as a part of LUCs.

55. **Comment:** *Figures 4-6 and 4-7:* The area proposed for excavation on Figure 4-7 is significantly smaller than that shown on Figure 4-6 and is for the same depth. Why is the area shown on Figure 4-7 described as being difficult to implement? See Specific Comment 50.

Response: Please see the Navy's response to the USEPA Specific Comments No. 50 and

MEDEP Comment No. 20. The figures will be revised. The discussion on implementability will be updated to reflect the current use of the DRMO. Based on current usage all of the alternatives will be evaluated under the same DRMO operations scenario. As a result alternatives with smaller excavation volumes will be considered easier to implement than excavation alternatives with larger volumes of soil.

56. **Comment:** *Figure 4-8:* Where is the second area that needs to be capped under Alternative DRMO-5? See Section 4.2.9.1 in the feasibility study. According to the legend, the area next to Building 298 is indicated as being excavated.

    Response: Based on the revised alternative, there is no longer a second area that needs to be capped under any of the DRMO alternatives.

57. **Comment:** *Figure 4-10:* If present, the filter bedding layer shown on this figure needs to be documented for the existing rip rap. It cannot be assumed that there is an effective barrier, already in place, to prevent lateral migration of contaminants migrating as or absorbed to fine grain material with the tidal cycles to the near/off shore environment.

    Response: Please see the Navy's responses to USEPA Comment No. 1 and Specific Comment No. 27. Figures 4-10, 4-11, and 4-12 have been removed from the FS.

58. **Comment:** *Figure 4-11*: It has not been documented that a filter layer exists beneath the in place rip rap revetment. See Specific Comment 57.

    Response: Please see the Navy's responses to USEPA Comment No. 1 and USEPA Specific Comment No. 27. Figures 4-10, 4-11, and 4-12 have been removed from the FS.

59. **Comment:** *Page 5-1, Section 5.1, 3rd and 4th Bullets:* The text should be changed from "capping" to "covering" since the feasibility study makes a distinction between these two terms. See Specific Comment 47, 2nd paragraph.

    Response: The text in Section 5 will be changed to indentify the WDA alternatives as the cover alternatives and the DRMO alternatives as the cap alternatives.

60. **Comment:** *Page 5-1, Section 5.1.1, 3rd Paragraph, 1st Sentence:* While a cover will contribute to prevention of erosion of surface soils, it will still allow infiltration into the soils with commensurate continued mobilization of fine grain material into the "rock fragment" fill material beneath. Existing "surface fill" material overly the coarser "rock fragment fill" with no intervening barrier. This overlying finer material will migrate to depth over time as rock and soils shift. This feasibility study and previous remedial investigation studies have not documented that lateral migration of contaminated fine grain particulate material will not occur. Therefore, it cannot be stated that the cover systems described will prevent migration of site contaminants to the Piscataqua River.

    Response: Please see the Navy's response to USEPA Comment No. 1.

61. **Comment:** *Page 5-4, Section 5.2.1:* None of the alternatives including DRMO 2 through 5 will assure that there will not be continued migration of contaminants to near/off shore environments. While dissolved phase contamination may be minimal, there has not been any documentation to support that the existing systems (revetments) will prevent the lateral migration of suspended particulate matter. Past near/off shore monitoring has indicated that

metals were increasing in concentrations. Further, there has not been any supplemental sediment sampling to substantiate lack of such transport since removal actions were conducted.

Response: Please see the Navy's response to USEPA Comment No. 1 for the revisions to alternatives.

62. **Comment:** *Page 5-8, Section 5.3.1:* It has not yet been documented that the existing rip rap revetment is effective at preventing lateral migration of contaminated find grain material through the revetment.

Response: Please see the Navy's responses to USEPA Comment No. 1 and USEPA Specific Comment No. 27.

63. **Comment:** *Table 5-1:* Alternatives WDA-3 and WDA-4 would not be protective of human health and the environment since all human and ecological receptor pathways will not have been removed. Infiltration will still occur as well as tidal fluctuations that could mobilize and transport contaminated fine grain material to the near/off shore environment.

Response: Please see the Navy's responses to USEPA Comment No. 1 and USEPA Specific Comment No. 48.

64. **Comment:** *Table 5-2:* Alternatives DRMO-4 and DRMO-5 would not be protective of human health and the environment. See Specific Comment 63.

Response: Please see the Navy's response to USEPA Comment No. 1.

65. **Comment:** *Table* 5-3: There appears to be several evaluation criteria missing from this table. The shoreline stabilization alternatives are to be considered part of the remedial systems for OU 2. Part of the function of these systems is to be designed to prevent lateral migration of contaminated fine grain particles from OU 2 to the near/off shore environment.

Response: As indicated in the Navy's response to USEPA Specific Comment No. 27, the shoreline stabilization alternatives are being removed from the text. As a results Table 5-3 will be removed as well.

66. **Comment:** Appendix A (PRG Development):

Page 1: In the second paragraph of the section entitled Preliminary Remediation Goals, it is mentioned in the second sentence that exposure to surface and subsurface soil (0-10 feet bgs) was considered for construction workers. Exposure to surface and subsurface soil (0-10 feet bgs) should also be considered for residential receptors because of the possibility that future residential development could involve excavation of soil to 10 feet bgs, stockpiling of soil on top of surface soil, and then re-grading of the mixed surface and subsurface soil around the new residences. Please ensure that the PRGs for 0-10 foot soil are protective for residential use.

Page 3: In the 3rd paragraph about copper concentrations, it is unclear whether remediation to achieve the residential lead PRG will take care of copper levels that exceed the residential PRG for copper. Please clarify, particularly since Figure A-8 indicates that some of the locations with copper greater than 7300 mg/kg may be less than 400 mg/kg lead.

Page 4: The first paragraph mentions that PAH concentrations outside the areas referred to were all less than 1 mg/kg, and were within the range of facility background. Please provide a reference to the documentation that demonstrates facility background for PAHs and any of the other COCs. Please clarify the last sentence to make it more understandable how remediation based on lead would address PAH and PCB contamination, ideally with a map.

Attachment 1 Development of Risk-Based Preliminary Remedial Goals: EPA concurs with the general mathematical approach; however, the reviewer was unable to cancel the appropriate units in the intake equations. In addition, the intake units were expressed as kg/kg/day, rather than mg/kg/day. Please correct this if appropriate, and provide an example with one chemical of the PRG calculation for ingestion, dermal, and inhalation, using the selected values for each parameter and showing cancellation of units, so that EPA can confirm the accuracy of the calculations. Also, please provide a working electronic copy of the Excel spreadsheets so that EPA can check the formulae and calculations.

Please explain why the exposure frequency for the industrial worker is 150 days.

Please explain why the soil ingestion rate for the construction worker is 50 mg/day for lead (Table 1), but 330 mg/day in the printout of the spreadsheets.

Please provide an attachment to the FS report that provides a summary of the exposure assumptions and toxicity factors for the receptors that were used in the RI risk assessment and carried through to the FS and calculation of PRGs. EPA Region I expects, going forward, that national level exposure assumptions (e.g. residential exposure period of 350 days per year) will take precedence over outdated EPA risk assumptions from the regional risk update reports (e.g. residential exposure period of 150 days).

Response page 1: The estimation of volume of soil for residential does account for surface and subsurface soil as discussed on pages 5 and 6.

Response page 3: Remediation to achieve residential lead PRGs will not take care of all copper residential PRGs exceedances in the backyard of Quarters N (in the DRMO Impact Area, north of former Building 146); therefore, as noted in the 2nd paragraph on page 4 both copper and lead were used to estimate remediation areas and volumes. Please note that Figure A-8 only provides copper results and does not provide information on lead concentrations.

Response page 4: A reference to final Facility Background Development Report (TtNUS, 2000) will be added to this paragraph. Figures A-9 and A-10 will be revised to also show where PAHs and PCB concentrations exceeded the residential and occupational PRGs. There were no exceedances of the construction worker PRGs for PAHs and PCBs; therefore, no change is required for Figure A-11.

Response Attachment 1: Intake units for calculating risks are expressed as mg/kg/day. When calculating clean-up levels the intake units are expressed as kg/kg/day. A sample calculation will be added as requested which shows the selected input values for each parameter and the cancellation of the units. An electronic copy of the spreadsheets will also be included.

The exposure frequency of 150 days/year for the industrial worker was the value used in the

OU2 HHRA and was the USEPA Region 1 default value at the time the HHRA was prepared. This exposure frequency is also consistent with typical number of work days that soil would be exposed considering typical amounts of snow fall for the area.

The soil ingestion rate for lead used differs from the soil ingestion rate for other chemicals. The adult lead model spreadsheets (Tables 1 to 5, Calculation of PRGs – Construction Worker) contain columns that present PRGs for various regions and various ethnic groups. The "Northeast/All" column contains the estimated PRG for a construction worker at OU2. This ingestion rate is 100 mg/day. For lead the adult lead model guidance recommends the use of CTE assumptions in evaluating adult exposures to lead in soil and 100 mg/day is the recommended value for a construction worker (USEPA, January 2003 and USEPA, 2009). For non-lead compounds, RME assumptions were used and an ingestion rate of 330 mg/day was used for the construction worker for all other COCs.

An attachment to the Draft Final FS Report will be provided that summarizes the exposure assumptions and toxicity factors used to calculate the PRGs.

References:

USEPA, January 2003. Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. EPA-540-R-03-001. December 1996 finalized January.

USEPA, 2009. USEPA Technical Review Workgroup for Lead. Frequently Asked Question (FAQs) on the Adult Lead Model, June 3. http://www.epa.gov/superfund/lead/almfaq.htm.

RESPONSES TO USEPA LEGAL COMMENTS DATED APRIL 29, 2010
DRAFT FEASIBILITY STUDY FOR OPERABLE UNIT 2
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

1. **Comment:** *Page ES-1, 2nd Paragraph, 7th sentence:* Identify which operable unit is addressing the contamination indentified in the residential lot N of the DRMO and the capped portion of the DRMO. If not addressed by a separate OU, these areas should be incorporated into the final remedy for OU2 (even if previously subject to a removal action), if contamination above un-restricted use risk levels is left in place.

   Response: The Navy concurs that the two areas identified in the comment need to be a part of the final remedy for OU2. The Navy notes that the referenced statement on page ES-1, with respect to the capped portion, is inaccurate. The DRMO capped area is included in the FS alternatives for the DRMO. The text in the referenced sentence in the 2nd paragraph on page ES-1 will be corrected by deleting "and the portion of the DRMO area that has already been capped." The following provides additional information on how the capped area is addressed in the OU2 FS and how the residential area of OU2 will be addressed in the remedy.

   DRMO Capped Area – In the November 2008 Revised Draft OU2 Feasibility Study (FS) Report the capped portion of the DRMO area was considered a final cap as part of the remedial alternative development. The FS alternatives for the DRMO included the capped area within the footprints for land use controls, periodic monitoring, and periodic inspection. Since the submission of the November 2008 Revised Draft OU2 FS Report, several technical meetings were held concerning the OU2 and OU2 FS alternatives. As a result of these technical meetings, the Navy agreed that the existing cap for the DRMO capped area was meant to be an interim measure and not a permanent remedy for the area. For the Draft Final OU2 FS Report, the Navy will revise the DRMO areas alternatives to include other options to address contamination within the capped area in the alternative development process. The revised alternatives, provided in Attachment B to these responses to comments, will be included in the Draft Final OU2 FS Report.

   Residential Area - The Navy believes that no change is required to include the residential area in the FS. The Navy is implementing an interim removal action for this area and it is anticipated that the interim removal action will result in unlimited use of and unlimited exposure to the residential area. The residential area will be included in the final remedy for OU2, but at the time the Record of Decision (ROD) is produced, the Navy believes that the final remedy for the residential area will be no further action (NFA).

2. **Comment:** *Page ES-2. 3rd Bullet:* Regarding the last sentence, maintenance of the shoreline erosion control needs to be a component of the remedy to prevent future risks from the erosion of soil from the OU area. If the revetment is a component of the remedy then long-term monitoring of the sediment needs to be a component of the remedy to ensure that the revetment remains effective.

   Response: The referenced text is part of the discussion of the conceptual site model and it indicates that erosion is not a current concern. However, the Navy recognizes that erosion is a future concern. As discussed further in the November 2008 Revised Draft OU2 FS Report, there is a Remedial Action Objective (RAO) that calls for the protection of the offshore environment from erosion of contaminated soil from the OU2 shoreline (RAO number 2, pages ES-2 and 2-14). Each alternative that leaves contamination on site

identifies the shoreline stabilization features currently along the OU2 shoreline as important to the integrity of the alternative. For the Draft Final OU2 FS Report, the Navy will include shoreline erosion controls within the land use controls (LUCs) component of each alternative along with the structural components of each remedy to satisfy the erosion protection RAO, as appropriate. The revised alternatives, provided in Attachment B to these responses to comments, will be included in the Draft Final OU2 FS Report.

As for monitoring the shoreline stabilization features, the LUCs for each alternative will be revised to include the following;

- Periodic inspections to ensure that the shoreline stabilization structures remain along the OU2 shoreline and that they appear to be in good condition (visual inspection).
- The offshore area will be periodically inspected for sediment accumulation.

However, because of the USEPA's preference to keep the onshore and offshore remedies separate for Portsmouth Naval Shipyard (PNS), monitoring offshore sediment for contamination is not included with shoreline stabilization inspection. Any remedial activities for offshore sediment are being addressed as part of OU4.

3. **Comment:** *Page ES-3. 2nd and 6th bullets:* There cannot be solely a LUC option. At the very least there must be long-term monitoring to ensure the remedy remains protective.

   Response: As indicated in the Navy's response to USEPA Legal Comment No. 1, several technical meetings focusing on the alternatives presented in the FS have occurred since the submission of the November 2008 Revised Draft OU2 FS Report and the receipt of these comments. The Navy has agreed to revise the alternatives to include monitoring. The revised alternatives, provided in Attachment B to these responses to comments, will be included in the Draft Final OU2 FS Report.

4. **Comment:** *Page ES-4. 2nd Paragraph. 2nd and 3rd Sentences:* Should state more clearly the WDA-2 would not be protective of the environment.

   Response: As indicated in Section 1.6.4, there are no onshore ecological risks associated with the WDA and no current offshore risks. The only environmental risk associated with the WDA is from potential future erosion of contaminated soil to the offshore area. LUCs, including shoreline and offshore inspection, are included in WDA-2; therefore, Alternative WDA-2 would be protective of the environment. The referenced text has been revised to read as follows:

   "WDA-2, WDA-3, and WDA-4 would provide protection of human health with Alternatives WDA-3 and WDA-4 providing the most protection. With the implementation of LUCs OU2 would be protective of the environment because the shoreline stabilization structures would be present to protect against the future potential of eroding soil to the off-shore area. Alternatives WDA-3 and WDA-4 would also protect the environment with Alternative WDA-4 providing the most protection."

5. **Comment:** *Page ES-4. 2nd Paragraph. 4th and 5th Sentences:* WDA-2 will not meet ARARs.

   Response: As indicated in the Navy's response to USEPA Legal Comment No. 1, several technical meetings focusing on the alternatives presented in the FS have occurred since the submission of the November 2008 Revised Draft OU2 FS Report and the receipt of these

comments. The Navy has agreed to revise the alternatives, including WDA-2. The Navy believes that USEPA concerns with WDA-2 have been addressed with the revisions to the alternatives agreed upon between the Navy, USEPA, and MEDEP. Please see the revised alternatives, provided in Attachment B to these responses to comments, that will be included in the Draft Final OU2 FS Report.

6. **Comment:** *Page ES-4. 2nd Paragraph. 6th Sentence*: WDA-2 does not meet the threshold criterion.

   Response: As indicated in the Navy's response to USEPA Legal Comment No. 1, several technical meetings focusing on the alternatives presented in the FS have occurred since the submission of the November 2008 Revised Draft OU2 FS Report and the receipt of these comments. The Navy has agreed to revise the alternatives, including WDA-2. The Navy believes that USEPA concerns with WDA-2 have been addressed with the revisions to the alternatives agreed upon between the Navy, USEPA, and MEDEP. Please see the revised alternatives, provided in Attachment B to these responses to comments, that will be included in the Draft Final OU2 FS Report.

7. **Comment:** *Page ES-4. 2nd Paragraph. 7th Sentence*: WDA-2 does not meet the long-term effectiveness and permanence criterion.

   Response: As indicated in the Navy's response to USEPA Legal Comment No. 1, several technical meetings focusing on the alternatives presented in the FS have occurred since the submission of the November 2008 Revised Draft OU2 FS Report and the receipt of these comments. The Navy has agreed to revise the alternatives, including WDA-2. The Navy believes that USEPA concerns with WDA-2 have been addressed with the revisions to the alternatives agreed upon between the Navy, USEPA, and MEDEP. Please see the revised alternatives, provided in Attachment B to these responses to comments, that will be included in the Draft Final OU2 FS Report.

8. **Comment:** *Page ES-4. Table:* There are five-year review costs for WDA-1 that should be included. Also spell out what "NPW" means.

   Response: The Navy respectfully disagrees that five-year review costs should be included for the No Action alternative, and no changes to the cost assumptions are warranted. The Navy concurs that if a remedial action is selected in a ROD that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, a five-year review is statutorily required. The Navy also agrees that in previous FSs, we have included the language USEPA seeks here. Recently, however, the Navy re-evaluated this language and realized that the "no action alternative" -- as that term is used in an FS -- is meant only to serve as a baseline from which to compare other alternatives. It is not the same "no action" reflected in a final ROD. This is consistent with the June 2010 Final OU1 FS Report. The Navy believes this interpretation is supported by OSWER Directive 9355.3-01 dated October 1988, which states that although a no-action alternative in an FS may include some type of environmental monitoring, "actions taken to reduce the potential for exposure (e.g., site fencing, deed restrictions) should not be included as a component of the no-action alternatives. Such minimal actions should constitute a separate 'limited' action alternative." The Navy believes the term "no action" in the FS context means literally no action at all, including no five year review. See Appendix F, Case Example of Detailed Analysis, in OSWER Directive 9355.3-01, which includes the phrase "This alternative also would require

a 5-year review" for several of the example alternatives, but does not use this wording for the "no action" example alternative.

NPW on Page ES-4 will be replaced with "Net Present Worth (NPW)."

9. **Comment:** *Page ES-4 – 5:* In the DRMO section all of the comments regarding WDA-2, above also pertain the DRMO-2. Also there are five-year review costs for DRMO-1 that should be included.

   Response: As indicated in the Navy's response to USEPA Legal Comment No. 3, the Navy, USEPA, and MEDEP have had several technical meetings since the submission of the November 2008 Revised Draft OU2 FS Report and changes will be made to the FS alternatives. With the agreed upon alternative changes, the Navy believes that the issues raised in the USEPA Legal Comment Nos. 4 to 7 also pertaining to DRMO-2 have been addressed.

   With regards to the five-year review costs for the DRMO-1, the Navy respectfully disagrees with the need for these five-year review costs. Please refer to the Navy's response to USEPA Legal Comment No. 8.

10. **Comment:** *Page ES-6*: The analysis for the Shoreline stabilization needs to meet all of the NCP criteria if the revetment serves as a component of the remedy to prevent release of contaminants into the adjoining river and its sediments. The SL-1 alternative does not meet any of the criteria because maintenance and monitoring of the revetment would not be a component of the remedy.

    Response: As discussed in the Navy's response to USEPA Legal Comment No. 2, the alternatives will be revised to address potential future erosion through LUCs and structural components of WDA and DRMO alternatives. Separate shoreline stabilization alternatives (SL-1, SL-2, and SL-3) will not be included in the Draft Final OU2 FS Report. The revised alternatives are described in Attachment B to these responses to comments. The evaluation of the NCP criteria for WDA and DRMO alternatives will be updated based on the revisions to the alternative components and the text on ES-6 related to SL-1, SL-2, and SL-3 will be deleted.

11. **Comment:** *Page 1-2, 1st Paragraph:* See comment 2. If the residential area is part of OU2, then the proposed removal action needs to be incorporated into the final OU2 ROD, either with a determination that the area is cleaned up to unrestricted use standards (in which case the ROD would include a No Further Action determination), or if restrictions will still be required because risks are still present (either for soil or groundwater) the FS needs to include an NCP analysis of remedial alternatives to address the remaining risk). The removal action should be described in more detail in this document.

    Response: As indicated in the Navy's response to USEPA Legal Comment No. 1, the Navy agrees that the residential area needs to be referred to in the OU2 ROD as having been subjected to an interim removal action that has left the area with no restrictions on use or exposure and that NFA is the proposed action for this area.

12. **Comment:** *Page 1-4, 5th Paragraph. 4th Sentence:* Was the former DRMO area capped as part of a CERCLA response action - if so describe in more detail.

Response: The capping of a portion of the DRMO area was not conducted as part of a CERCLA response. As discussed on page 1-6, the cap was installed as part of an interim action in 1993.

13. **Comment:** *Page 1-7, 4th Paragraph:* Since the landfill/incinerator operations were closed pre-RCRA, any hazardous waste ARARs cited for alternatives addressing the landfill waste would be "Relevant and Appropriate."

    Response: The referenced text is in Section 1.4.3 of the November 2008 Revised Draft OU2 FS Report, which discusses OU2 History. ARARs are discussed in Section 2.0. The Navy considers hazardous waste ARARs would be applicable if characterization of excavated material or remediation waste indicates the material to be a hazardous waste. RCRA regulations for capping would be relevant and appropriate for alternatives that include a RCRA C cap. Revisions to ARARs are discussed in the Navy's responses to subsequent USEPA Legal Comments and proposed revised Section 2.0, and supporting ARARs tables (Tables 2-1, 2-2, and 2-3) for the Draft Final OU2 FS Report are included in Attachment C to these responses to comments.

14. **Comment:** *Page 1-11, 1st Paragraph. 1st Sentence:* Long-term monitoring of the sediment will be required to assess the protectiveness of the shoreline revetment (assuming waste is left in place and the revetment is a component of the remedy).

    Response: The referenced text is in Section 1.6 of the November 2008 Revised Draft OU2 FS Report, which provides a summary of the OU2 Supplemental RI Report. As a result of resolution of comments on the September 2008 Draft OU2 Supplemental RI Report and consistent with the March 2010 Final OU2 Supplemental RI Report, the text in the referenced section has been revised. Proposed revisions to Section 1.0 for the Draft Final OU2 FS Report are provided in Attachment C to these responses to comments.

    Regarding long-term monitoring of sediment, long-term inspection for sediment accumulation will be included in OU2 alternatives, as appropriate. However, as indicated in the Navy's response to USEPA Legal Comment No. 2, because of the USEPA's preference to keep the onshore and offshore remedies separate for PNS, remedial action for offshore sediment is not included with shoreline stabilization inspection.

15. **Comment:** *Page 1-13, last Paragraph, 4th and 5th Sentences:* Is the River critical habitat for any Federal or State endangered, threatened or protected species (for instance – the federally endangered short-nosed sturgeon which does live in the River).

    Response: There is no designated critical habitat for the short-nosed sturgeon in the State of Maine. The following text will be added (to Section 1.6.1.4): "The short-nosed sturgeon is a federally endangered species that is found along the eastern seaboard, but has no critical habitats located within the State of Maine. Populations in Maine are found in the Sheepscot, Kennebec, Androscoggin, and Penobscot Rivers, and Merrymeeting Bay (Maine Department of Inland Fisheries and Wildlife, 2003)."

16. **Comment:** *Page 1-16, last Sentence and Page 1-17, 1st Paragraph:* See comment 21. For CERCLA remediation purposes, it doesn't matter what the source of the lead is if it is posing a risk.

Response: The referenced text is in Section 1.6.2 of the November 2008 Revised Draft OU2 FS Report, which provides a summary of the nature and extent of contamination as provided in the OU2 Supplemental RI Report. As a result of resolution of comments on the September 2008 Draft OU2 Supplemental RI Report and consistent with the March 2010 Final OU2 Supplemental RI Report, the text in the referenced section has been revised. Therefore, the Navy believes that USEPA's concern cited in this comment has been resolved. Proposed revisions to Section 1.0 for the Draft Final OU2 FS Report are provided in Attachment C to these responses to comments.

17. **Comment:** *Page 1-17, 4th Paragraph, last Sentence*: Long-term monitoring of sediment will be required for contamination being left in place.

Response: The referenced text is in Section 1.6.2 of the November 2008 Revised Draft OU2 FS Report, which provides a summary of the nature and extent of contamination as provided in the OU2 Supplemental RI Report. As a result of resolution of comments on the September 2008 Draft OU2 Supplemental RI Report and consistent with the March 2010 Final OU2 Supplemental RI Report, the text in the referenced section has been revised. Proposed revisions to Section 1.0 for the Draft Final OU2 FS Report are provided in Attachment C to these responses to comments.

Regarding long-term monitoring of sediment, please refer to the Navy's response to USEPA Legal Comment No. 2.

18. **Comment:** *Page 1-18, 2nd Paragraph*: Were risks calculated for a future residential use scenario? The outer bounds of the remedial area (within the OU) is defined by where there are no risks to unrestricted use.

Response: The referenced text is in Section 1.6.4 of the November 2008 Revised Draft OU2 FS Report, which provides a summary of the risk assessment in the OU2 Supplemental RI Report. Risks for the future residential use scenario were calculated in the human health risk assessment. The text in the first paragraph of Section 1.6.4 will be revised to clarify that the human health risk assessment evaluated potential risks for potential future land use conditions including residential use.
A residential remediation area was developed in the November 2008 Revised Draft OU2 FS Report. Please refer to Figure 2-1 for the limits of soil contamination that cause unacceptable residential risk.

19. **Comment:** *Page 1-19, 1st Paragraph, 3rd Sentence*: There is potential future risk to sediment if wastes are left in place and current erosion control measures fail, so the erosion controls along the shoreline need to be monitored and maintained as a component of the remedy.

Response: The referenced text is in Section 1.6.4 of the November 2008 Revised Draft OU2 FS Report, which provides a summary of the risk assessment in the OU2 Supplemental RI Report. As a result of resolution of comments on the September 2008 Draft OU2 Supplemental RI Report and consistent with the March 2010 Final OU2 Supplemental RI Report, the text in the referenced section has been revised. Proposed revisions to Section 1.0 for the Draft Final OU2 FS Report are provided in Attachment C to these responses to comments.

Regarding long-term maintenance and monitoring of erosion controls, please refer to the Navy's response to USEPA Legal Comment No. 2.

20. **Comment:** *Page 1-19, § 1.6.5*: This section needs to be modified base on EPA's previous comments.

Response: The referenced Section 1.6.5 of the November 2008 Revised Draft OU2 FS Report provides a summary of the conclusions and recommendations of the OU2 Supplemental RI Report. As a result of resolution of comments on the September 2008 Draft OU2 Supplemental RI Report and consistent with the March 2010 Final OU2 Supplemental RI Report, the text in the referenced section has been revised. Proposed revisions to Section 1.0 for the Draft Final OU2 FS Report are provided in Attachment C to these responses to comments.

21. **Comment:** *Page 1-20, 4th bullet*: If contamination is left in place, maintenance and monitoring of the erosion control structures needs to be a component of the remedy to prevent potential future risks of release.

Response: The referenced text is in Section 1.7 of the November 2008 Revised Draft OU2 FS Report, which provides a summary of the conceptual site model for OU2. As a result of resolution of comments on the September 2008 Draft OU2 Supplemental RI Report and consistent with the March 2010 Final OU2 Supplemental RI Report, the text in the referenced section has been revised. Proposed revisions to Section 1.0 for the Draft Final OU2 FS Report are provided in Attachment C to these responses to comments.

Regarding long-term maintenance and monitoring of erosion controls, please refer to the Navy's response to USEPA Legal Comment No. 2.

22. **Comment:** *Page 1-20*, 5th bullet: Were residential risk levels exceeded elsewhere within the OU, other than in the portion of the DRMO Impact Area? If so, identify these areas in this bullet.

Response: Residential risk levels were exceeded across the DRMO area, the waste disposal area, and within portions of the DRMO impact area. The bullet explaining exceedances of residential risk levels will be revised to indicate that unacceptable residential risks were found in a portion of the DRMO Impact Area and for the entire DRMO and waste disposal area.

23. **Comment:** *Page 2-1, 3rd Paragraph:* Change "facility-citing" to "facility-siting."

Response: The text will be revised to read "facility-siting."

24. **Comment:** *Page 2-3, 2nd Paragraph*: Remove the paragraph. There are no potential ARARs.

Response: The requested text will be removed and the ARARs tables updated. Instead a discussion of when an ARAR is invoked will be added to the discussion under the Action To Be Taken heading in the tables.

25. **Comment:** *Page 2-4, 2nd Paragraph*: Remove the paragraph - screening level guidance is not a TBC.

Response: The Navy respectfully disagrees. USEPA Region 9 PRGs (risk-based screening levels) were used in the risk assessment as screening levels and were included in the ARARs sections as TBCs. They have recently been replaced by the USEPA Regional Screening Levels. The text on Page 2-4 will be revised to indicate that in 2008, USEPA replaced region-specific risk-based screening levels (e.g., Region 9 PRGs) with RSLs. The USEPA risk-based screening levels were used as screening levels as part of the HHRA for OU2 and can be used to develop soil clean up goals. This information will also be provided in Table 2-1. This is consistent with the June 2010 Final OU1 FS Report.

26. **Comment:** *Page 2-4, 3rd Paragraph*: Remove the paragraph - federal risk assessment procedures, rather than State standards pertain to CERCLA cleanups.

Response: The Maine risk guidance documents will be removed from the text and ARARs tables, consistent with the June 2010 Final OU1 FS Report.

27. **Comment:** *Page 2-4*: Add paragraphs on the additional Chemical-specific ARARs and TBCs added to the revised Chapter 2 ARARs Tables.

Response: Text will be added to Section 2.0 and the ARARs tables to discuss the additional chemical-specific ARARs and TBCs. The revisions are shown in the revised Section 2.0 text and Table 2-1, included as Attachment C to these responses to comments.

28. **Comment:** *Page 2-4, 4th Paragraph*: Replace the text with: "Published Remedial Action Guideline (RAGs) that are more stringent than federal standards were used to establish cleanup standards."

Response: The text will be revised to reflect the update in RAGs (2010) and that these guidelines can be considered for PRG development.

29. **Comment:** *Page 2-5, 1st Paragraph*: Remove the paragraph since the requirements of the Executive Order have been removed from 40 C.F.R. Part 6. Compliance with the Executive Order is now a matter to be addressed under the Protectiveness criterion, rather than the ARARs criterion.

Response: The Navy concurs that the Executive Order should be removed as an ARAR for OU2, and will remove the paragraph from the text and Table 2-2.

30. **Comment:** *Page 2-5, 2nd Paragraph*: Change "16 United States Code (USC) 1451 et seq." to "16 United States Code (U.S.C.) § 1451 *et seq.*"

Response: The citation will be revised to read "[16 United States Code (USC) §1451 *et seq.*".

31. **Comment:** *Page 2-5, 3rd Paragraph*: Change "33 USC 403; 33 CFR 320-323" to "33 U.S.C. § 403; 33 C.F.R. Parts 320-323."

Response: The Rivers and Harbor Act will be deleted as an ARAR because remedial activities for OU2 will not obstruct or alter the river.

32. **Comment:** *Page 2-5, 4th Paragraph*: Remove the paragraph since the requirements of the Executive Order have been removed from 40 C.F.R. Part 6. Compliance with the Executive

Order is now a matter to be addressed under the Protectiveness criterion, rather than the ARARs criterion. This is consistent with the Draft Final Portsmouth OU1 FS (April 2010).

Response: The Navy concurs and the reference will be removed from the text and Table 2-2.

33. **Comment:** *Page 2-6, 2nd Paragraph*: Change the citation to: "Clean Water Act, Sec 404; Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (33 U.S.C. § 1344; 40 C.F.R. Part 230, 231 and 33 C.F.R. Parts 320-323)"

Response: The citation will be revised to read "Clean Water Act (CWA) - Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR Parts 230-232; 33 CFR Parts 320-330)."

34. **Comment:** *Page 2-6, 3rd Paragraph*: Change the citation to: "National Historic Preservation Act of 1966; Protection of Historic Properties ((16 U.S.C. § 470 *et seq.*; 36 C.F.R. Part 800)." Change the second sentence (to be consistent with the 4th paragraph of Page 1-11) to: "Prehistoric and historic archaeological resource sensitivities for the DRMO Impact Area (particularly near Quarters S and N) are moderate and high, respectively. The rest of OU2 has low or moderate sensitivity for prehistoric and historic archaeological resources."

Response: The citation will be revised to read "The National Historical Preservation Act (16 USC §470 *et seq.*, 36 CFR Part 800)." The text from page 1-11 will be added to Section 2.0.

35. **Comment:** *Page 2-6, 4th Paragraph*: Change the citation to the Fish and Wildlife Coordination Act to: "(16 U.S.C. § 661 *et seq.*)" and remove the citation to the Wetlands Executive Order because it no longer is included in a promulgated regulation. Change the text to: "Requires Federal agencies involved in actions that will result in the control of structural modification of any stream or body of water for any purpose, to take action to protect the fish and wildlife resources that may be affected by the action. The Navy must consult with appropriate federal and state resource agencies to ascertain the means and measures necessary to mitigate, prevent, and compensate for project-related losses of fish and wildlife resources and to enhance the resources. Since remedial action may involve work (including O&M of the revetment) within the floodplain of the Piscataqua River and long-term monitoring will be conducted to ensure that any wastes left in place to not impact fish and wildlife resources in the River these standard are applicable.

Response: The Fish and Wildlife Coordination Act will be added as an ARAR because remediation work may be conducted in a coastal flood zone or adjacent to the Piscataqua River. Precautions would be taken during remedial action to minimize potential adverse impacts to fish and wildlife. Erosion controls and stormwater management would be conducted in accordance with Maine requirements. Please see the revised ARARs tables attached to these responses to comments. The Fish and Wildlife Coordination Act will be added to the text and Table 2-2 consistent with the June 2010 Final OU1 FS Report.

36. **Comment:** *Page 2-6, Bottom*: Add paragraphs on the additional Location-specific ARARs and TBCs added to the revised Chapter 2 ARARs Tables.

Response: Text will be added to Section 2.0 to discuss the additional location-specific ARARs and TBCs that are added to the text. The revisions are shown in the revised Section 2.0 text and Table 2-2 included in Attachment C to these responses to comments.

37. **Comment:** *Page 2-7, 2nd Paragraph:* Change the citation to "16 U.S.C. Chapter 35; 50 C.F.R. Parts 200 and 402." Remove the fourth sentence and note that the Federally listed short-nosed sturgeon does utilize the Piscataqua River. So any remedial action that may effect water quality in the River should address requirements under this standard. Regarding the fifth sentence note that the bald eagle has been delisted from both the federal and state endangered and threatened species lists. Remove the last sentence of the paragraph since promulgated standards cannot be TBCs.

Response: The cited paragraph will be replaced with the following text:

"The Endangered Species Act of 1973 (16 USC §1531 et seq.) provides for consideration of impacts to endangered and threatened species and their critical habitats. As discussed in Section 1.0, there are no known endangered or threatened species at OU2; however, the federally-listed endangered short-nosed sturgeon is known to occur in the Piscataqua River. There are no known critical habitats for the short-nosed sturgeon in the State of Maine. The Act requires federal agencies to ensure that any action carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or adversely affect its critical habitat. Remedial activities would be conducted so as to avoid any adverse effect under the Endangered Species Act to the short-nosed sturgeon."

The status of the Endangered Species Act will be listed as applicable.

38. **Comment:** *Page 2-8, 3rd Paragraph:* Add a new second sentence: "Jurisdiction under the Rules extends 75 feet landwards of the outer edge of a protected resource area."

Response: The following text will be added to the text and Table 2-2:

"Jurisdiction under the Rules includes the area adjacent to wetlands, which is the area within 75 feet of the normal high water line."

39. **Comment:** *Page 2-8, 5th Paragraph:* Paragraph not needed if there are no state-listed species on the Site or utilizing the river adjacent to the site. Although mentioned in the paragraph there is no other mention of nesting bald eagles (note that these have been delisted) or roseate terns in the area.

Response: The Navy concurs that the Maine Endangered Species Act should be removed as an ARAR for OU2, and will remove the paragraph from the text and Table 2-2. This is consistent with the June 2010 Final OU1 FS Report.

40. **Comment:** *Page 2-8, 6th Paragraph:* Remove the paragraph if not Significant Wildlife Habitat.

Response: The Navy concurs that the Maine Significant Wildlife Habitat Rules should be removed as an ARAR for OU2, and will remove the paragraph from the text and Table 2-2. This is consistent with the June 2010 Final OU1 FS Report.

41. **Comment:** *Page 2-9, § 2.1.3:* Add paragraphs on any additional Action-specific ARARs and TBCs added to the revised Chapter 2 ARARs Tables.

Response: Text will be added to Section 2.0 to discuss the additional action-specific ARARs and TBCs. The revisions are shown in the revised Section 2.0 text and Table 2-3 included in Attachment C to these responses to comments.

42. **Comment:** *Page 2-9, 4th Paragraph:* Discuss that RCRA is a delegated program in ME. The ARARs text can provide a general description of RCRA and leave the specific citation of applicable standards to the Maine Hazardous Waste Rule section.

Response: The Navy agrees and will delete text under federal RCRA standards and include more detail on The Maine Hazardous Waste Rules. This is consistent with the June 2010 Final OU1 FS Report.

43. **Comment:** *Page 2-9, 5th Paragraph:* In third sentence remove "potentially" before "applicable."

Response: The change will be made as requested.

44. **Comment:** *Pages 2-9 and 2-10, last 2 bullets on 2-9 and first 2 on 2-10:* Cite the Maine Hazardous Waste Rules rather then these RCRA citations.

Response: The bulleted items will be removed from the text. Please refer to the Navy's response to Comment No. 42.

45. **Comment:** *Page 2-10, 4th Paragraph:* Remove this paragraph since LDR standards are not ARARs for CERCLA sites. ARARs do not apply to off-site disposal.

Response: The Navy concurs that the LDRs should be removed as an ARAR for OU2, and will remove the paragraph from the text and Table 2-3. This is consistent with the June 2010 Final OU1 FS Report.

46. **Comment:** *Page 2-10, last Paragraph:* Remove this paragraph since CAMU standards are not required to keep capped waste in place within an OU.

Response: The Navy concurs that the CAMU requirements should be removed as an ARAR for OU2, and will remove the paragraph from the text and Table 2-3. This is consistent with the June 2010 Final OU1 FS Report.

47. **Comment:** *Page 2-11, 4th Paragraph:* This section should discuss TSCA and it regulations (in particular 40 C.F.R. 761.61(c), which are the risk-based standards for PCB remediation waste) rather than the policy. TSCA can regulate PCBs less than 50 ppm that poses a risk to human health or the environment (waste over 50 ppm needs to be disposed of in a TSCA-compliant disposal facility).

Response: PCBs were detected at concentrations less than 50 ppm and are not ARARs for OU2. Text related to TSCA will be deleted.

48. **Comment:** *Page 2-11, 6th Paragraph:* Remove the paragraph since NAAQs are not ARARs, rather federal NESHAPs if applicable would be the federal air ARARs cited.

Response: The Navy concurs that the discussion of NAAQs be removed from the text. NESHAPs will not be added to the text because OU2 does not fit the USEPA's definition of a source as defined by the NESHAPs. Therefore, NESHAPs is not applicable for OU2.

49. **Comment:** *Page 2-11, last Paragraph:* Cite the specific sections of the State Hazardous Waste Regulations, rather than citing the specific RCRA regulations, since ME is a delegated state and the State regulations are the enforceable standards.

Response: The text will be revised as requested, consistent with the June 2010 Final OU1 FS Report. Please also refer to the Navy's response to Comment No. 42.

50. **Comment:** *Page 2-12, 1st Paragraph:* Add a new last sentence: These standards would be "Relevant and Appropriate" for any waste left in place (that exceed characteristic hazardous waste thresholds) that was disposed of prior to 1980.

Response: The Navy respectfully disagrees. These performance standards would be applicable if excavated material is determined to be a characteristic hazardous waste. The text will be revised consistent with the June 2010 Final OU1 FS Report.

51. **Comment:** *Page 2-13, 3rd Paragraph:* Remove the paragraph since the Uniform Environmental Covenants is administrative and is not an ARAR (there can be text elsewhere in the document that states that if the property is ever transferred from the Navy a deed will be created that incorporates the institutional control restrictions that may be required and that the deed will comply with state recording standards.)

Response: The Navy concurs that the Uniform Environmental Covenants Act should be removed as an ARAR for OU2, and will remove the paragraph from the text and Table 2-3. This is consistent with the June 2010 Final OU1 FS Report.

52. **Comment:** *Page 2-16, 2nd Paragraph:* Regarding the third sentence; while the removal action may not be included as a component of the remedy in the ROD, if any contamination is left after the removal that poses a risk to unrestricted use, long-term monitoring and institutional controls for the area will need to included as part of the remedial action within the ROD.

Response: Comment noted. However, it is the intent of the interim action that there would be no need for future use restrictions following the completion of the OU2 residential area interim action.

53. **Comment:** *Page 2-16, 3rd Paragraph:* Regarding the fifth sentence, the interim cap may not be sufficient to meet ARARs under the ROD.

Response: The text will be revised. Please refer to the Navy's response to USEPA Legal Comment No. 1 for additional information for revisions related to the interim capped area for the Draft Final OU2 FS Report.

54. **Comment:** *Page 2-17, 4th Paragraph:* Change "1,6000" to "1,600."

Response: The requested text change will be made to the document.

55. **Comment:** *Table 2-1:* Use the following Table for the Chemical-specific ARARs (which are consistent with other EPA sites in ME):

Regulatory Authority	Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Requirement
Federal Criteria, Advisories and Guidance	U.S. Environmental Protection Agency (USEPA) Risk Reference Doses (RfDs)	To Be Considered	RfDs are estimates of daily exposure levels that are unlikely to cause significant adverse non-carcinogenic health effects over a lifetime.	Alternatives will be developed that will address non-carcinogenic risks within the OU.
Federal Criteria, Advisories and Guidance	Guidelines for Carcinogen Risk Assessment EPA/630/P-03/001F (March 2005)	To Be Considered	Guidance for assessing cancer risk.	Alternatives will be developed that will address carcinogenic risks within the OU.
Federal Criteria, Advisories and Guidance	Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens EPA/630/R-03/003F (March 2005)	To Be Considered	Guidance of assessing cancer risks to children.	Alternatives will be developed that will address carcinogenic risks to children within the OU.
Federal Criteria, Advisories and Guidance	USEPA Carcinogen Assessment Group, Cancer Slope Factors (CSFs)	To Be Considered	CSFs are used to compute the incremental cancer risk from exposure to site contaminants and represent the most up-to-date information on cancer risk from USEPA's Carcinogen Assessment Group.	Alternatives will be developed that will address carcinogenic risks within the OU.
Federal Criteria, Advisories and Guidance	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposure to Lead in Soil	To Be Considered	EPA guidance for evaluating the risks posed by lead in soil.	Alternatives will be developed that will meet this standard by addressing lead-impacted soil exceeding adult risk levels in the OU.
State	Maine Solid Waste Rules, Lead Management Regulations (06-096 C.M.R. Chapter 424]	Relevant and Appropriate	Regulations establish lead safe standards for soil containing lead – if lead in soil exceeds 375 parts per million (ppm) in bare soil in potential play areas or 1000 ppm in other than play areas, the soil in these areas shall be considered a lead hazard.	Alternatives will be developed that will meet the "Lead Safe" standard by addressing lead-impacted soil in a manner that will either permit unrestricted residential use or will restrict use to prevent residential exposure.

Regulatory Authority	Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Requirement
State Criteria, Advisories and Guidance	Maine Voluntary Response Action Program, Remedial Action Guidelines for Hazardous Substances in Soil (May 20, 1997)	To Be Considered	These guidelines provide specific chemical concentrations determined by the ME DEP to be protective of human health under various direct exposure scenarios and protective of groundwater. Includes standards for copper that do not have Federal standards.	Alternatives will be developed to meet these standards by addressing risks posed by soil contaminants to human health and the environment.

Notes:
ARAR=Applicable or Relevant and Appropriate Requirement
C.F.R. = Code of Federal Regulations
C.M.R. = Code of Maine Regulations
ppm = parts per million
CSF = Cancer Slope Factor
RfD = Risk Reference Dose
ME DEP = Maine Department of Environmental Protection
USEPA = U.S. Environmental Protection Agency

If there is non-saline groundwater within the OU then the following groundwater chemical-specific ARARs should be added:

Federal	Safe Drinking Water Act (42 U.S.C. §300f *et seq.*); National primary drinking water regulations (40 C.F.R. Part 141, Subpart B and G)	Relevant and Appropriate	Establishes maximum contaminant levels (MCLs) for common organic and inorganic contaminants applicable to public drinking water supplies. Used as relevant and appropriate cleanup standards for aquifers and surface water bodies that are potential drinking water sources.	In areas with non-saline groundwater all alternatives will be developed that will meet these drinking water standards.
Federal	Safe Drinking Water Act (42 U.S.C. §300f *et seq.*); National primary drinking water regulations (40 C.F.R. 141, Subpart F)	Relevant and Appropriate	Establishes maximum contaminant level goals (MCLGs) for public water supplies. MCLGs are health goals for drinking water sources. These unenforceable health goals are available for a number of organic and inorganic compounds.	In areas with non-saline groundwater all alternatives will be developed that will meet these drinking water standards.
Federal	Health Advisories (Office of Drinking Water)	To Be Considered	Health Advisories are estimates of risk due to consumption of contaminated drinking water; they consider non-carcinogenic effects only. To be considered for contaminants in groundwater that may be used for drinking water where the standard is more conservative than either Federal or State statutory or regulatory standards. The Health Advisory standard for manganese is 0.3 mg/L.	In areas with non-saline groundwater all alternatives will be developed that will meet these drinking water standards.

State	Maine Drinking Water Rules (10-144A CMR Chapters 231, 232 and 233)	Relevant and Appropriate	All non-saline groundwater in Maine needs to meet these standards. Maine's Primary Drinking Water Standards are equivalent to Federal MCLs.	In areas with non-saline groundwater all alternatives will be developed that will meet these drinking water standards.

2) *Table 2:* Use the following Table for the Location-specific ARARs (which are consistent with other EPA sites in ME):

Regulatory Authority	**Requirement**	**Status**	**Requirement Synopsis**	**Action to be Taken to Attain Requirement**
Federal	Rivers and Harbors Act of 1899 (33 U.S.C. § 403 *et seq.*; 33 C.F.R. Parts 320-323)	Relevant and Appropriate	Section 10 of the Rivers and Harbors Act prohibits unauthorized obstruction or alteration of navigable waters. No activity that impacts waters of the United States shall be permitted if a practicable alternative that has less adverse impact exists. If there is no other practicable alternative, the impacts must be mitigated.	Remedial alternatives will be designed such that navigable waters would not be obstructed or altered in order to meet the substantive environmental requirements under these standards.
Federal	Clean Water Act, Sec 404 (33 U.S.C. § 1344); Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 C.F.R. Part 230, 231 and 33 C.F.R. Parts 320-323)	Applicable	These regulations outline the requirements for the discharge of dredged or fill materials into surface waters including Federal jurisdictional wetlands. No activity that impacts waters of the United States shall be permitted if a practicable alternative that has less adverse impact exists. If there is no other practicable alternative, the impacts must be mitigated.	Alternatives will be developed that will seek to avoid or minimize the destruction of Federal jurisdictional wetlands and aquatic habitats. Compensatory habitat mitigation may be performed, if required.

Regulatory Authority	Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Requirement
Federal	Fish and Wildlife Coordination Act (16 USC 661 *et seq.*)	Applicable	Requires Federal agencies involved in actions that will result in the control of structural modification of any stream or body of water for any purpose, to take action to protect the fish and wildlife resources that may be affected by the action. The Navy must consult with appropriate Federal and State resource agencies to ascertain the means and measures necessary to mitigate, prevent, and compensate for project-related losses of fish and wildlife resources and to enhance the resources.	Measures to mitigate or compensate adverse project-related impacts to fish and wildlife resources will be taken, if determined necessary. The appropriate Federal and State resource agencies will be consulted.
Federal	Endangered Species Act of 1973 (16 U.S.C. Chapter 35)	Applicable	Provides for consideration of impacts to endangered and threatened species and their habitats. Requires federal agencies to ensure that any actions carried out by the agency are not likely to jeopardize the continued existence of any endangered or threatened species or adversely affect its critical habitat. The short-nosed sturgeon (*Acipenser brevirostrum*), a federally-listed, endangered species, occurs in the Piscataqua River.	Any remedial action that may affect the Piscataqua River will address potential substantive requirements under these standards to protect the endangered sturgeon.
Federal	Coastal Zone Management Act (16 U.S.C. § 1451 *et seq.*)	Applicable	Require activities in the designated coastal zone be conducted in a manner consistent with coastal zone management plans.	If remedial actions at OU2 potentially impact coastal zone resources, the substantive, environmental requirements under these standards will be met.
Federal	National Historic Preservation Act of 1966 (16 U.S.C. § 470 *et seq.*); Protection of Historic Properties (36 C.F.R. Part 800)	Applicable	Section 106 of the NHPA requires Federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment.	Features with potential historical/cultural significance will be evaluated during the remedial design phase. Should any alternative impact historical properties/structures protected by these standards activities will be coordinated with the Advisory Council on Historic Preservation.

Regulatory Authority	Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Requirement
State	Maine Natural Resources Protection Act (NRPA) (38 M.R.S.A. §§ 480-A to 480-Z)	Applicable	The NRPA regulates activities affecting protected natural resources: coastal sand dune systems, coastal wetlands, significant wildlife habitat, fragile mountain areas, freshwater wetlands, great ponds and rivers, streams or brooks.	Remedial activities affecting regulated natural resources, particularly the alteration of coastal wetlands/waterways, will meet substantive environmental standards under the Act.
State	Maine NRPA, Wetlands Protection Rule (06-096 C.M.R., Chapter 310)	Applicable	The regulations prohibit activities which would have an unreasonable impact on wetlands (or within 75 feet of the outer boundary of the wetland) or cause a loss in wetland area, functions, and values. Under the Rules, "Wetlands of Special Significance" are defined as all coastal wetlands and great ponds as well as certain freshwater wetlands which include (a) Significant wildlife habitat, as defined by 38 M.R.S.A. § 480-B(10); (b) A freshwater wetland area located within 250 feet of a coastal wetland; (c) Wetlands subject to flooding during a 100-year flood event; (e) A freshwater wetland area located within 25 feet of a river, stream, or brook. If there is no practicable alternative, there must be minimal alteration of the wetland and compensation (off-setting) may be required.	Function and value assessments will be performed, if necessary, for existing coastal wetland/ habitat, particularly any "Wetlands of Special Significance." The impacts associated with the remedial alternatives that are unavoidable will be minimized to reduce adverse effects on wetlands and mitigation measures may be taken, if necessary.
State	Maine NRPA, Permit-by-Rule Standards (06-096 C.M.R., Chapter 305)	Applicable	This rule prescribes standards for specific activities that may take place in or adjacent to wetlands and water bodies. The standards are designed to ensure that the disturbed soil material is stabilized to prevent erosion and siltation of the water.	Response actions will be performed to minimize impacts to coastal wetlands or waterways.

Regulatory Authority	Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Requirement
State	Maine Mandatory Shoreland Zoning Act (38 M.R.S.A. §§ 435-449; 06-096 CMR Chapter 1000)	Relevant and Appropriate	To protect and conserve shoreland areas by controlling activities within 250 feet of high water mark, as defined in State law.	Measures will be taken during selection, design, and implementation of remedial actions to comply with the substantive environmental requirements under the Act.
State	Submerged and Intertidal Lands Act (12 M.R.S.A. §§ 1861-1867)	Applicable	The statute establishes the State's ownership and management of submerged, intertidal, and filled tidal land throughout the State.	The substantive environmental requirements of this standard will be achieved for any remedial action that effect State submerged and intertidal lands.
State	Coastal Management Policy Act (38 M.R.S.A. § 1801 *et seq.*)	Applicable	Provide for the regulation, conservation, beneficial use, and management of coastal resources.	The substantive environmental requirements of this standard will be achieved, including consultation with relevant State agencies.
State	Maine Site Location of Development Law and Regulations (38 M.R.S.A. §§ 481-490. Also 06-096 C.M.R. Chapters 374 and 375)	Applicable	Regulations apply to control activities at certain developments so that there are minimal adverse impacts to natural resources, including erosion and sedimentation control, noise control, historic protection, and air quality control.	Remedial alternatives will comply with applicable environmental requirements. Storm water management and erosion and sedimentation controls will be designed and implemented so that adverse effects on natural resources are minimized.
State	Additional Standards Applicable to Waste Facilities Located in a Flood Plain (06-096 C.M.R. 854(16)).	Relevant and Appropriate for contaminated media exceeding characteristic waste thresholds left in place that was generated prior to 1980.	Any facility located or to be located within 300 feet of a 100 year flood zone must be constructed, operated, and maintained to prevent wash-out of any hazardous waste by a 100 year flood or have procedures in place that which will cause the waste to be removed to a location where the waste will not be vulnerable to flood waters and to a location which is authorized to manage hazardous waste safely before flood water can reach the facility.	Waste left in place or managed within 300 feet of the 100 year flood zone will be managed in compliance with these standards.

Notes:

ARAR = Applicable or Relevant and Appropriate Requirement
C.F.R. = Code of Federal Regulations
C.M.R. = Code of Maine Regulations
ME DEP = Maine Department of Environmental Protection
MNA = Monitored Natural Attenuation
M.R.S.A. = Maine Revised Statutes Annotated
U.S.C. = United States Code
USEPA = U.S. Environmental Protection Agency

3). *Table 2:* Use the following Table for the Action-specific ARARs (which are consistent with other EPA sites in ME):

Regulatory Authority	Requirement	Status	Requirement Synopsis	Actions to be Taken to Attain Requirement
Federal	Clean Water Act Section 402 National Pollutant Discharge Elimination System (NPDES) (40 C.F.R. 122-125 and 131)	Applicable	This act and regulations establish discharge limitations, monitoring requirements, and best management practices. Point-source discharges of effluent to surface water must comply with NPDES requirements (e.g., Federal and State water quality criteria).	Any alternative that include on-site discharges to surface waters as part of the remedial action, shall meet these substantive discharge standards. These discharge limitations shall also be used to develop monitoring standards for surface waters.
Federal	Toxic Substances Control Act (TSCA); PCB Remediation Waste (40 C.F.R.761.61(c)	Applicable	This section of the TSCA regulations provides risk-based cleanup and disposal options for PCB remediation waste based on the risks posed by the concentrations at which the PCBs are found. Written approval for the proposed risk-based cleanup must be obtained from the Director, Office of Site Remediation and Restoration, U.S. Environmental Protection Agency (USEPA) Region 1.	The risk-based remediation of PCB contaminated soil will be performed in a manner to comply with TSCA. The ROD will include a finding by the Director, Office of Site Remediation and Restoration, EPA Region 1, that the PCB cleanup level selected will not pose an unreasonable risk to human health or the environment.
Federal	Resource Conservation and Recovery Act (RCRA)(42 U.S.C. §6901 *et seq.*), Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 C.F.R. Parts 260-262)	Relevant and Appropriate for contaminated media exceeding characteristic waste thresholds left in place that was generated prior to 1980.	Federal standards used to identify, manage, and dispose of hazardous waste. Maine has been delegated the authority to administer these RCRA standards through its State hazardous waste management regulations. These provisions have been adopted by the State.	Wastes generated as part of remedial activities will be characterized as hazardous or non-hazardous. Testing will also be done to determine the extent of any hazardous waste that is to be managed in place. If determined to be hazardous waste, then they will be managed in accordance with these standards.

Regulatory Authority	Requirement	Status	Requirement Synopsis	Actions to be Taken to Attain Requirement
Federal	Clean Water Act (33 U.S.C. § 1251 *et seq.*); National Recommended Water Quality Criteria ("NRWQC") (40 C.F.R. § 122.44)	Relevant and Appropriate	Used to establish water quality standards for the protection of aquatic life.	Standards to be used for monitoring water quality during remedial activities adjacent to the river and long-term water quality monitoring for any contaminated media left within the coastal flood zone of the river (including under and behind the revetment.
Federal Criteria, Advisories and Guidance	EPA's Polychlorinated Biphenyl (PCB) Site Revitalization Guidance Under the Toxic Substances Control Act (November 2005)	To Be Considered	Provides information on characterizing, cleaning up, containing, and disposing of PCB waste (e.g., soil and other debris generated as a result of any PCB spill cleanup) and guidance in complying with the PCB regulations at 40 C.F.R. Part 761.	The remediation of PCB contaminated soil will be performed in a manner to comply with TSCA.
Federal Criteria, Advisories and Guidance	USEPA OSWER Publication 9345.3-03 FS, January 1992	To Be Considered	Management of Investigation-Derived Waste (IDW) must ensure protection of human health and the environment.	IDW will be managed in a manner to protect human health and the environment.
State	Maine Hazardous Waste Rules for Identification and Listing of Hazardous Wastes (38 M.R.S.A. § 1301 *et seq.*; 06-096 C.M.R. 850)	Applicable	These standards establish requirements for determining whether wastes are hazardous based on either characteristics or listing.	Wastes generated as part of remedial activities will be characterized as hazardous or non-hazardous. Testing will also be done to determine the extent of any hazardous waste that is to be managed in place. If determined to be hazardous waste, then the waste will be managed in accordance with these standards.
State	Maine Hazardous Waste Management Rules - Requirements for Generators (38 M.R.S.A. § 1301 *et seq.*; 06-096 CMR 851)	Applicable	These regulations contain requirements for generators of hazardous waste.	Wastes generated by the Navy within the OU since 1980, if characterized as hazardous, will be managed in accordance with these standards.

Regulatory Authority	Requirement	Status	Requirement Synopsis	Actions to be Taken to Attain Requirement
State	Maine Hazardous Waste Management Rules – Standards for Hazardous Waste Facilities (38 M.R.S.A. § 1301 *et seq.*; 06-096 CMR 854)	Relevant and Appropriate for contaminated media exceeding characteristic waste thresholds left in place that was generated prior to 1980.	This rule specifies the standards applicable to the establishment, construction, alteration and operation of waste facilities for hazardous waste in Maine, including monitoring, closure, and post-closure. Regulated facilities include hazardous waste landfills (8), waste piles (11), tanks (12), and miscellaneous units (15).	These standards are applicable to any hazardous waste left in place that was disposed of after 1980 and also to hazardous waste generated as part of the remedial action. Contaminated media left in place that was disposed of prior to 1980, but which exceed characteristic hazardous waste thresholds will be subject to relevant and appropriate standards identified from the rules, including long-term monitoring, institutional control, closure, and post-closure standards.
State	Maine Solid Waste Management Rules (06-096 C.M.R. Chapter 400-411)	Applicable	Provides standard for generation, treatment, storage, and disposal of solid and special wastes. Also provides closure and post-closure standards.	Solid wastes generated or left in place would be managed in accordance with these standards.
State	Maine Waste Discharge Licenses (38 M.R.S.A. § 413 *et seq.*) and Waste Discharge Permitting Program (06-096 C.M.R. Chapter 520-529)	Applicable	These standards regulate the discharge of pollutants from point sources.	All substantive requirements of these standards will be met with respect to any point source discharge to surface water. Appropriate controls and best management practices will be implemented.

Regulatory Authority	Requirement	Status	Requirement Synopsis	Actions to be Taken to Attain Requirement
State	Maine Water Classification Program (38 M.R.S.A., Section 464-470)	Applicable	This program sets forth standards for the classification of Maine's water. Activities in a water body cannot lower water quality below the designated classification. The Piscataqua River adjacent to the Site is designated Class SB. Designated uses for Class SB waters include recreation in and on the water, fishing, aquaculture, propagation and harvesting of shellfish, industrial process and cooling water supply, hydroelectric power generation, navigation and as habitat for fish and other estuarine and marine life.	Site activities will be designed and implemented in a manner that does not degrade the chemical, physical, or biological integrity of the Piscataqua River. Water quality will be monitored during remedial operations. Long-term water quality monitoring of wastes left in place in the floodway of the river will also be conducted.
State	Maine Surface Water Toxics Program (38 M.R.S.A. §. 420; 06-096 C.M.R. Chapter 530)	Applicable	These rules set forth the State water quality criteria for toxic water pollutants and procedures necessary to control levels of toxic pollutants in surface waters.	Site activities will be designed and implemented in a manner that does not degrade the chemical, physical, or biological integrity of the Piscataqua River. Water quality will be monitored during remedial operations. Long-term water quality monitoring of wastes left in place in the floodway of the river will also be conducted.
State	Maine Surface Water Quality Criteria for Toxic Pollutants (06-096 C.M.R. Chapter 584)	Applicable	Except if they naturally occur, levels of toxic pollutants in surface waters must not exceed State water quality criteria.	Site activities will be designed and implemented in a manner that does not degrade the chemical, physical, or biological integrity of the Piscataqua River. Water quality will be monitored during remedial operations. Long-term water quality monitoring of wastes left in place in the floodway of the river will also be conducted.

Regulatory Authority	Requirement	Status	Requirement Synopsis	Actions to be Taken to Attain Requirement
State	Maine Erosion and Sedimentation Control (38 M.R.S.A. § 420-C)	Applicable	Activities that involve filling, displacing, or exposing soil or other earthen materials must take measures to prevent unreasonable erosion of soil or sediment beyond the project site or into a protected natural resource. Erosion control measures must be in place before the activity begins. Measures must remain in place and functional until the site is permanently stabilized.	Appropriate controls will be implemented to address erosion, sedimentation, and storm water.
State	Maine Storm Water Management (38 M.R.S.A. § 420-D), Maine Storm Water Management Rules (06 096 C.M.R. Chapter 500), and Direct Watershed of Waterbodies Most at Risk from New Development and Sensitive or Threatened Regions or Watersheds (06-096 C.M.R. Chapter 502)	Applicable	Storm water quality standards for projects with 3 acres or less of impervious surface may address phosphorus, nitrates, and suspended solids, but may not directly address other dissolved or hazardous materials unless infiltration is proposed. The Storm Water Management Rules establish standards to prevent and control the release of pollutants to water bodies, wetlands, and groundwater, and reduce impacts associated with increases and changes in flow.	Where activities described in 38 M.R.S.A. 420-D occur at the Site, appropriate controls to address erosion, sedimentation, and storm water will be implemented. Erosion control measures will be in place prior to any remedial action that will disturb the ground surface.

Regulatory Authority	Requirement	Status	Requirement Synopsis	Actions to be Taken to Attain Requirement
State	Maine Air Quality Control Laws; Protection and Improvements of Air (38 M.S.R.A. 581-608-A), Chapters 101, 105, 110, 115)	Applicable	This law and its associated regulations detail the requirements, limitations, and exemptions of State air emissions, including fugitive dust and lead. The standard for particulate matter is 150 µg/m3 (micrograms per cubic meter), 24 hour average concentration.	Dust suppression and any other air controls that may be required will be utilized as needed to comply with this standard.
State Criteria, Advisories and Guidance	Maine Department of Human Services Interim Ambient Air Guidelines, Memorandum February 23, 1993.	To Be Considered	Interim ambient air guidelines are derived from risk assessment-based criteria or from occupational exposure criteria that are protective of ambient air quality.	These guidelines will be considered during the design of remedial measure that may cause air emissions.

Notes:

ARAR = Applicable or Relevant and Appropriate Requirement
CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act
C.F.R. = Code of Federal Regulations
C.M.R. = Code of Maine Regulations
IDW = Investigation-Derived Waste
ME DEP = Maine Department of Environmental Protection
M.R.S.A. = Maine Revised Statutes Annotated
µg/m3 = micrograms per cubic meter
NPDES = National Pollutant Discharge Elimination System
OSWER = Office of Solid Waste and Emergency Response
U.S.C. = United States Code
USEPA = U.S. Environmental Protection Agency

Response: The following provides the explanation of how each of the ARARs or TBCs provided in USEPA Legal Comment No. 55 related to Tables 2-1 (chemical-specific), 2-2 (location-specific), and 2-3 (action-specific) ARARs and TBCs are being addressed in the OU2 FS, as appropriate.

Chemical-Specific ARARs

Regulatory Authority	Requirement	How is this requirement addressed in the Chemical-Specific ARARs Tables?
Federal Criteria, Advisories and Guidance	U.S. Environmental Protection Agency (USEPA) Risk Reference Doses (RfDs)	The Navy agrees that this requirement should remain in the OU2 FS. This citation was included in the Revised Draft OU2 FS (November 2008) and is consistent the Final OU1 FS (June 2010). Refer to

Regulatory Authority	Requirement	How is this requirement addressed in the Chemical-Specific ARARs Tables?
		Table 2-1 in Attachment C for text changes.
Federal Criteria, Advisories and Guidance	Guidelines for Carcinogen Risk Assessment EPA/630/P-03/001F (March 2005)	The Navy agrees that this requirement should be included in the OU2 FS and will add the requested citation to the document. Refer to Table 2-1 in Attachment C for text changes.
Federal Criteria, Advisories and Guidance	Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens EPA/630/R-03/003F (March 2005)	The Navy agrees that this requirement should be included in the OU2 FS and will add the requested citation to the document. Refer to Table 2-1 in Attachment C for text changes.
Federal Criteria, Advisories and Guidance	USEPA Carcinogen Assessment Group, Cancer Slope Factors (CSFs)	The Navy agrees that this requirement should remain in the OU2 FS. This citation was included in the Revised Draft OU2 FS (November 2008) and is consistent the Final OU1 FS (June 2010). Refer to Table 2-1 in Attachment C for text changes.
Federal Criteria, Advisories and Guidance	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposure to Lead in Soil	The Navy agrees that this requirement should be included in the OU2 FS and will add the requested citation to the document. This is consistent with the Final OU1 FS (June 2010). Refer to Table 2-1 in Attachment C for text changes.
State	Maine Solid Waste Rules, Lead Management Regulations (06-096 C.M.R. Chapter 424]	The Navy respectfully disagrees that the Maine Solid Waste Act, Lead Management Regulations is relevant and appropriate and the requested citation will not be added to the document. As stated in the Maine Solid Waste Lead Management Regulation Chapter 424, "This Chapter applies to any person who engages in lead-based paint activities in residential dwellings and child-occupied facilities in Maine." OU2 is not a lead-based paint site and is neither a residential dwelling nor child-occupied facility, and therefore is not applicable or relevant and appropriate for remedial activities at OU2. USEPA methodology for assessing risk in soil for lead is more relevant for OU2 than these Maine Regulations; therefore, these Maine Regulations were also not considered as TBC. This is consistent with the Final OU1 FS (June 2010).
State Criteria, Advisories and Guidance	Maine Voluntary Response Action Program, Remedial Action Guidelines for Hazardous Substances in Soil (May 20, 1997)	The Navy agrees that this requirement should remain in the OU2 FS as TBC. This citation was included in the Revised Draft OU2 FS (November 2008). The reference will be updated to reflect the changes made to the Remedial Action Guidelines published January 13, 2010. Refer to Table 2-1 in Attachment C for text changes.

Regulatory Authority	Requirement	How is this requirement addressed in the Chemical-Specific ARARs Tables?
Federal	Safe Drinking Water Act (42 U.S.C. §300f *et seq.*); National primary drinking water regulations (40 C.F.R. Part 141, Subpart B and G)	Groundwater at OU2 is brackish/saline and is not a potable source of water; therefore, these chemical-specific ARARs will not be added to the text or table.
Federal	Safe Drinking Water Act (42 U.S.C. §300f *et seq.*); National primary drinking water regulations (40 C.F.R. 141, Subpart F)	
Federal	Health Advisories (Office of Drinking Water)	
State	Maine Drinking Water Rules (10-144A CMR Chapters 231, 232 and 233)	

Location-Specific ARARs

Regulatory Authority	Requirement	How is this requirement addressed in the Location-Specific ARARs Tables?
Federal	Rivers and Harbors Act of 1899 (33 U.S.C. § 403 *et seq.*; 33 C.F.R. Parts 320-323)	The Navy respectfully disagrees that the Rivers and Harbors Act is relevant and appropriate because there are no anticipated offshore activities as part of remedial activities for any of the alternatives evaluated. The requested citation will be removed from the document. This is consistent with the Final OU1 FS (June 2010).
Federal	Clean Water Act, Sec 404 (33 U.S.C. § 1344); Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 C.F.R. Part 230, 231 and 33 C.F.R. Parts 320-323)	The Navy agrees that this requirement should remain in the OU2 FS. This citation was included in the Revised Draft OU2 FS (November 2008). Refer to Table 2-2 in Attachment C for text changes.
Federal	Fish and Wildlife Coordination Act (16 USC 661 *et seq.*)	This requirement was included in the Revised Draft OU2 FS and the Navy agrees that this citation should remain in the OU2 FS. This is consistent with the Final OU1 FS (June 2010). Refer to Table 2-2 in Attachment C for text changes.

Regulatory Authority	Requirement	How is this requirement addressed in the Location-Specific ARARs Tables?
Federal	Endangered Species Act of 1973 (16 U.S.C. Chapter 35)	This requirement was included in the Revised Draft OU2 FS. The Navy agrees that this citation should remain in the OU2 FS based on information from the NOAA Fisheries Office website which states that short-nosed sturgeon occur in the Piscataqua River. This is consistent with the Final OU1 FS (June 2010). Refer to Table 2-2 in Attachment C for text changes.
Federal	Coastal Zone Management Act (16 U.S.C. § 1451 *et seq.*)	This requirement was included in the Revised Draft OU2 FS and the Navy agrees that this citation should remain in the OU2 FS. This is consistent with the Final OU1 FS (June 2010). Refer to Table 2-2 in Attachment C for text changes.
Federal	National Historic Preservation Act of 1966 (16 U.S.C. § 470 *et seq.*); Protection of Historic Properties (36 C.F.R. Part 800)	This requirement was included in the Revised Draft OU2 FS and the Navy agrees that this citation should remain in the OU2 FS. This is consistent with the Final OU1 FS (June 2010). Refer to Table 2-2 in Attachment C for text changes.
State	Maine Natural Resources Protection Act (NRPA) (38 M.R.S.A. §§ 480-A to 480-Z)	This requirement was included in the Revised Draft OU2 FS and the Navy agrees that this citation should remain in the OU2 FS. This is consistent with the Final OU1 FS (June 2010). Refer to Table 2-2 in Attachment C for text changes.
State	Maine NRPA, Wetlands Protection Rule (06-096 C.M.R., Chapter 310)	This requirement was included in the Revised Draft OU2 FS and the Navy agrees that this citation should remain in the OU2 FS. Based on MEDEP definition for wetlands included in Chapter 1000: Guidelines for Municipal Shoreline Zoning Ordinances, there are coastal wetlands within 250' of OU2. Therefore, this ARAR is applicable to remedial activities at OU2. Refer to Table 2-2 in Attachment C for text changes.
State	Maine NRPA, Permit-by-Rule Standards (06-096 C.M.R., Chapter 305)	This requirement was included in the Revised Draft OU2 FS and the Navy agrees that this citation should remain in the OU2 FS. This is consistent with the Final OU1 FS (June 2010). Refer to Table 2-2 in Attachment C for text changes.

Regulatory Authority	Requirement	How is this requirement addressed in the Location-Specific ARARs Tables?
State	Maine Mandatory Shoreland Zoning Act (38 M.R.S.A. §§ 435-449; 06-096 CMR Chapter 1000)	The Navy respectfully disagrees that the Maine Mandatory Shoreline Zoning Act is relevant and appropriate and the requested citation will not be added to the FS. This is consistent with the Final OU1 FS (June 2010). There do not appear to be any environmental requirements within the Maine Mandatory Shoreland Zoning Act that would be considered relevant and appropriate to this cleanup except the 38 MRSA 439-B requirements for an excavation contractor conducting excavation activity in a shoreland area to be certified in erosion control practices by MEDEP. However, that requirement, however, does not become effective until January 1, 2013. The remedial action is expected to be completed prior to the effective date of this section. There are no other standards within the Act that would be both relevant and appropriate.
State	Submerged and Intertidal Lands Act (12 M.R.S.A. §§ 1861-1867)	The Navy respectfully disagrees that the Submerged and Intertidal Lands Act is applicable and the requested citation will not be added to the FS. This is consistent with the Final OU1 FS (June 2010). Alternatives would not impact state-owned filled tide lands, and the state has no jurisdiction over filled tide lands located on base property; therefore, this Act would neither be applicable nor relevant and appropriate to this cleanup.
State	Coastal Management Policy Act (38 M.R.S.A. § 1801 *et seq.*)	This requirement was included in the Revised Draft OU2 FS and the Navy agrees that this citation should remain in the OU2 FS. This is consistent with the Final OU1 FS (June 2010). Refer to Table 2-2 in Attachment C for text changes.
State	Maine Site Location of Development Law and Regulations (38 M.R.S.A. §§ 481-490. Also 06-096 C.M.R. Chapters 374 and 375)	This requirement was included in the Revised Draft OU2 FS and the Navy agrees that this citation should remain in the OU2 FS. The reference for the requirement will be revised to 38 MRSA 481 et seq. and 06-096 CMR 371-377. This is consistent with the Final OU1 FS (June 2010). 38 MRSA 482 – 490 will not be included in the OU2 FS because many of these sections have been repealed or are not applicable to the site location at OU2. Refer to Table 2-2 in Attachment C for text changes.
State	Additional Standards Applicable to Waste Facilities Located in a Flood Plain (06-096 C.M.R. 854(16)).	The Navy agrees that this requirement should be included in the OU2 FS and will add the requested citation to the document. However, the reference citation will be included as an action-specific ARAR. Refer to Table 2-3 in Attachment C for text changes.

Action-Specific ARARs

Regulatory Authority	Requirement	Status

Regulatory Authority	Requirement	Status
Federal	Clean Water Act Section 402 National Pollutant Discharge Elimination System (NPDES) (40 C.F.R. 122-125 and 131)	The Navy agrees that this requirement should be included in the OU2 FS and will add the requested citation to the document. The reference for the requirement will be revised to 40 CFR 122-125. This is consistent with the Final OU1 FS (June 2010). 40 CFR 131 will not be included in the OU2 FS because it is describes the requirements and procedures for States to develop, review, revise, and approve water quality standards. Therefore, this part is not applicable to remedial actions at OU2. Refer to Table 2-3 in Attachment C for text changes.
Federal	Toxic Substances Control Act (TSCA); PCB Remediation Waste (40 C.F.R.761.61(c)	The Navy respectfully disagrees that the Toxic Substances Control Act is applicable and the requested citation will not be added to the FS. There is no evidence of PCBs at concentrations greater than 50 ppm; therefore, these guidelines are not applicable for OU2.
Federal	Resource Conservation and Recovery Act (RCRA)(42 U.S.C. §6901 *et seq.*), Subtitle C-Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 C.F.R. Parts 260-262)	This requirement was included in the Revised Draft OU2 FS and the Navy agrees that this citation should remain in the OU2 FS. This is consistent with the Final OU1 FS (June 2010). Refer to Table 2-3 in Attachment C for text changes.
Federal	Clean Water Act (33 U.S.C. § 1251 *et seq.*); National Recommended Water Quality Criteria ("NRWQC") (40 C.F.R. § 122.44)	This requirement was included in the Revised Draft OU2 FS and the Navy agrees that this citation should remain in the OU2 FS. This is consistent with the Final OU1 FS (June 2010). Refer to Table 2-3 in Attachment C for text changes.
Federal Criteria, Advisories and Guidance	EPA's Polychlorinated Biphenyl (PCB) Site Revitalization Guidance Under the Toxic Substances Control Act (November 2005)	The Navy respectfully disagrees that the EPA's PCB Site Revitalization Guidance is TBC and the requested citation will not be added to the FS. There is no evidence of PCBs at concentrations greater than 50 ppm, therefore, these guidelines are not considered for OU2.
Federal Criteria, Advisories and Guidance	USEPA OSWER Publication 9345.3-03 FS, January 1992	The Navy respectfully disagrees that the OSWER Publication 9345.3-03 is TBC and the requested citation will not be added to the FS. Investigation-derived waste is waste that is generated in the process of investigating or examining an actual or potentially contaminated site. No such waste will be generated during OU2 remedial activities.

Regulatory Authority	Requirement	Status
State	Maine Hazardous Waste Rules for Identification and Listing of Hazardous Wastes (38 M.R.S.A. § 1301 *et seq.*; 06-096 C.M.R. 850)	This requirement was included in the Revised Draft OU2 FS and the Navy agrees that this citation should remain in the OU2 FS. This is consistent with the Final OU1 FS (June 2010). Refer to Table 2-3 in Attachment C for text changes.
State	Maine Hazardous Waste Management Rules - Requirements for Generators (38 M.R.S.A. § 1301 *et seq.*; 06-096 CMR 851)	This requirement was included in the Revised Draft OU2 FS and the Navy agrees that this citation should remain in the OU2 FS. This is consistent with the Final OU1 FS (June 2010). The citation will be revised to also include 38 MRSA 1301 et seq. Refer to Table 2-3 in Attachment C for text changes.
State	Maine Hazardous Waste Management Rules – Standards for Hazardous Waste Facilities (38 M.R.S.A. § 1301 *et seq.*; 06-096 CMR 854)	The Navy respectfully disagrees that the Maine Hazardous Waste Management Rules – Standards for Hazardous Waste Facilities are applicable to remedial actions at OU2. There are no hazardous waste facilities located at OU2.
State	Maine Solid Waste Management Rules (06-096 C.M.R. Chapter 400-411)	This requirement was included in the Revised Draft OU2 FS and the Navy agrees that this citation should remain in the OU2 FS. Consistent with the Final OU1 FS (June 2010) the citation will be revised to read 06-096 CMR Chapters 400 and 411. Chapters 401 through 410 are not applicable to remedial activities at OU2. Refer to Table 2-3 in Attachment C for text changes.
State	Maine Waste Discharge Licenses (38 M.R.S.A. § 413 *et seq.*) and Waste Discharge Permitting Program (06-096 C.M.R. Chapter 520-529)	The Navy agrees that these requirements should be included in the OU2 FS. Based on review of the Maine Waste Discharge Licenses and Maine Waste Discharge Permitting Program these requirements would be applicable to remedial alternatives that require water management during soil excavation. Refer to Table 2-3 in Attachment C for text changes.
State	Maine Water Classification Program (38 M.R.S.A., Section 464-470)	This requirement was included in the Revised Draft OU2 FS and the Navy agrees that this citation should remain in the OU2 FS. This is consistent with the Final OU1 FS (June 2010). The citation will be revised to also include 38 MRSA 465-470. Refer to Table 2-3 in Attachment C for text changes.
State	Maine Surface Water Toxics Program (38 M.R.S.A. §. 420; 06-096 C.M.R. Chapter 530)	This requirement was included in the Revised Draft OU2 FS and the Navy agrees that this citation should remain in the OU2 FS. This is consistent with the Final OU1 FS (June 2010). Refer to Table 2-3 in Attachment C for text changes.

Regulatory Authority	Requirement	Status
State	Maine Surface Water Quality Criteria for Toxic Pollutants (06-096 C.M.R. Chapter 584)	The Navy respectfully disagrees that the Maine Surface Water Quality Criteria for Toxic Pollutants is applicable to remedial actions for OU2. This is consistent with the Final OU1 FS (June 2010).
State	Maine Erosion and Sedimentation Control (38 M.R.S.A. § 420-C)	This requirement was included in the Revised Draft OU2 FS and the Navy agrees that this citation should remain in the OU2 FS. This is consistent with the Final OU1 FS (June 2010). Refer to Table 2-3 in Attachment C for text changes.
State	Maine Storm Water Management (38 M.R.S.A. § 420-D), Maine Storm Water Management Rules (06 096 C.M.R. Chapter 500), and Direct Watershed of Waterbodies Most at Risk from New Development and Sensitive or Threatened Regions or Watersheds (06-096 C.M.R. Chapter 502)	The Navy agrees that the Maine Storm Water Management and Maine Storm Water Management Rules should be included in the OU2 FS and will add the requested citations to the document. This is consistent with the Final OU1 FS (June 2010). The Navy respectfully disagrees that the Direct Watershed of Waterbodies Most at Risk from New Development and Sensitive or Threatened Regions or Watersheds is applicable to remedial actions at OU2. These regulations do not list any lakes or streams in the vicinity of OU2 that are at risk from new development.
State	Maine Air Quality Control Laws; Protection and Improvements of Air (38 M.S.R.A. 581-608-A), Chapters 101, 105, 110, 115)	The Navy respectfully disagrees that the Maine Air Quality Control Laws; Protection and Improvements of Air and Interim Ambient Air Guidelines are applicable or TBC, respectively, for remedial actions at OU2. This is consistent with the Final OU1 FS (June 2010). Instead, the Maine Visible Emissions Regulation (38 MRSA 584; 06-096 CMR 101), which establish opacity limits for emissions from several categories of air contaminant sources, including general construction activities, will be added to the text. These regulations would be relevant and appropriate for alternatives that have the potential to impact air quality. These standards would be met if any of the alternatives result in emission of particulate matter and fugitive matter to the atmosphere (e.g., dust generation).
State Criteria, Advisories and Guidance	Maine Department of Human Services Interim Ambient Air Guidelines, Memorandum February 23, 1993.	

56. **Comment:** *Page 3-1, 1st dash subheading:* After "or volume" add "through treatment."

Response: The requested text change will be made.

57. **Comment:** *Page 3-2, § 3.1.1:* Add a new last sentence: "Statutorily required five-year reviews would be conducted under the no action response if contamination that poses a risk is left in place."

Response: Five-year reviews will not be included in the No Action Alternative. Please refer to the Navy's response to USEPA Legal Comment No. 8 for additional information.

58. **Comment:** *Page 3-3, 5th Paragraph:* In the first sentence after "conditions," add "ARARs requirements."

Response: No text change is required. ARARs were not considered as part of the preliminary screening of alternatives. ARARs were considered in the evaluations of the development of alternatives.

59. **Comment:** *Page 3-4, Soil Remediation Table:* For Containment/Remedial Technology may need to add "Groundwater Protection" and "Vapor Protection." For Disposal/Process Option change "Off yard" to "Off-site" and remove the paragraph after the tables; also add "On-Site Landfilling," which at least could pertain to the interim cap area.

Response: Groundwater protection, vapor protection, and on-site landfilling will be added to the technology screening table. Groundwater protection will be retained and evaluated further and addressed through monitoring. Vapor protection will be eliminated due the lack of volatile contaminants present at OU2. On-site landfilling will be retained and evaluated further and addressed through upgrading the existing temporary cap with a permanent cap.

As for changing the term "off-yard" of "off-site", the facility is used to seeing the "off-yard" terminology, this requested change was not made to the document. Lastly, the paragraph following the table on page 3-4 has been removed from the text.

60. **Comment:** *Page 3-4, Shoreline Stabilization Table:* For Limited Action/Remedial Technology need to add LUCs and Monitoring.

Response: As a result of the technical meetings and the re-alignment of the alternatives the shoreline stabilization table will be removed from the text as well as the text that evaluated the shoreline stabilization as standalone alternatives. The shoreline stabilization requirements are now handled through the implementation of LUCs under each alternative that leave contaminants onsite.

61. **Comment:** *Page 3-5, §3.3.1* – Note that for No Action there still is a requirement for statutorily required five-year reviews, so that should be discussed under Implementability and Cost.

Response: Five-year reviews will not be included in the No Action alternative. Please refer to the Navy's response to USEPA Legal Comment No. 8 for additional information.

62. **Comment:** *P. 3-5, §3.3.2* – The discussion of LUCs should include the use of Base Instructions for active facilities and the requirement to establish deed restrictions meeting State recording requirements if the property is transferred from the Navy.

Response: The following text will be inserted at the end of the first paragraph in Section 3.3.2, consistent with the Navy language used in the LUC RD template:

"The Navy would establish LUCs for a remedy, if needed, in a post-ROD Land Use Control Remedial Design (LUC RD). The LUC RD would set out the specific actions needed to implement, operate, maintain, and enforce the LUC component of the remedy. Should the property ever be transferred out of federal control to private ownership, the deed given to the property recipient would contain deed restrictions, consistent with state law, necessary to continue implementation of the required LUCs."

63. **Comment:** *P. 3-6, 5th Paragraph* – In the second sentence insert "and monitoring" after "LUCs."

    Response: The requested text will be added to the document.

64. **Comment:** *P. 3-11, §3.3.6* – Note that if PCBs over 50 ppm are present *in-situ* the waste would need to go to a TSCA-compliant facility.

    Response: The Navy agrees with the comment; however, there is no evidence of PCBs at concentrations greater than 50 ppm at OU2. Text will be added to the FS to clarify that all soil being disposed off-yard will be characterized for proper disposal.

65. **Comment:** *P. 3-12, §3.4.1* - Note that for No Action there still is a requirement for statutorily required five-year reviews, so that should be discussed under Implementability and Cost.

    Response: Five-year reviews will not be added to the No Action alternative. Please refer to the Navy's response to USEPA Legal Comment No. 8 for additional information.

66. **Comment:** *P. 3-13, §3.4.2* – This section needs to include discussion of monitoring to make sure contamination is not being released through the shoreline protection structure.

    Response: Text indicating monitoring for the accumulation of sediment will be added to the alternatives and Section 3.4.2 consistent with the Navy's response to USEPA Legal Comment No. 2. Text will also be added consistent with the same response to comment that analytical sampling of sediment that may accumulate along the offshore area of OU2 will be performed as part of OU4 based on the request of the USEPA.

ATTACHMENT A

NOVEMBER 2008 MEETING NOTES

SUMMARY OF DISCUSSIONS ON OPERABLE UNIT 2
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
November 17 to 21, 2008

The following summarizes discussion on several major issues related to the Operable Unit (OU) 2 draft Supplemental Remedial Investigation (RI) Report and revised draft OU2 Feasibility Study (FS) Report as part of the following:

- November 17, 2008 review of the draft Restoration Advisory Board (RAB) meeting presentation on the revised draft OU2 FS Report. Teleconference among the Navy team and regulators.
- November 19, 2008 dry run presentation at Portsmouth Naval Shipyard on the RAB meeting presentation on the revised draft OU2 FS Report. Meeting attended by Navy team.
- November 20, 2008 technical meeting at Portsmouth Naval Shipyard on the draft Supplemental RI Report. Meeting attended by Navy team and regulators.
- November 20, 2008 RAB meeting at Kittery Fire Station, Kittery, Maine during the presentation on the revised draft OU2 FS Report.

November 17, 2008 review of draft RAB presentation

During the review of the draft RAB presentation, two major issues were discussed and include evaluation of the capped area and contamination under buildings at OU2.

General discussion: The area referred to as the capped area in the draft RI and draft revised FS Reports was capped in 1993 as part of an interim action. The interim action was conducted to provide a cover over highly contaminated materials. The capping in 1993 was conducted as an interim action; an evaluation of the interim action would be necessary to determine whether the cap is adequate as a final action or whether it would need to be modified to meet capping requirements for a final action. Action item: Although retaining the existing cap was considered in all of the alternatives developed in the draft revised FS Report, the Navy will provide an evaluation of the condition of the existing cap to support either retaining the cap or modifying the cap as part of alternatives in the draft final FS Report.

General discussion: Retaining Buildings 310 and 298 was considered in all of the draft revised FS Report alternatives. Because the buildings would act as a cover to prevent human exposure to contaminated materials under the building, the alternatives only evaluated using land use controls (LUCs) to prevent modification or removal of the buildings without appropriate management and site restoration to prevent human exposure to contaminated materials. Removal of the buildings with excavation or capping of the contaminated materials was not included in the draft revised FS Report. Action item: Figures showing remediation areas will be revised to include hatching over the buildings to show that the buildings are included in the remediation areas. Text in the FS Report will be revised to clarify how contamination under the buildings is addressed in the alternatives.

November 19, 2008 dry run of RAB presentation

Navy personnel at the Shipyard provided some additional thoughts related to evaluation of the capped area and contamination under buildings at OU2.

General discussion: Alternatives for the DRMO portion of OU2 and the waste disposal portion of OU2 include retaining the existing cap or capping additional portions of OU2 with the appropriate land use restrictions. The Shipyard would like to have information to evaluate removal of contaminated material to reduce the amount of land use restrictions for the area. In addition, when there are significant land use restrictions, the Shipyard prefers the area with the restrictions to be green space. An alternative that includes complete excavation of waste material in the waste disposal area was screened out in the alternative screening stage in the draft revised OU2 FS Report. Excavation of waste material was considered much less feasible than the alternatives retained for the waste disposal areas because the waste material is in the subsurface (beginning at approximately 4 feet bgs) and extends to bedrock (10 to 40 feet bgs). Therefore, there are various implementability and cost concerns for excavation compared to placement of a cover. In the DRMO portion of OU2, the contaminated material is in the top 6 feet bgs and excavation of the material could be feasible. Action item: The Navy will revise the alternatives in the draft final FS Report to include excavation of the contaminated material in the capped area along with alternatives that consider retaining or modifying the existing cap. The alternatives will be reviewed and text revised to include a final cover of vegetation or other green space if appropriate.

General discussion: The Shipyard anticipates continuing to use Building 298 as an office building; however, operations in Building 310 could be moved and the building could be removed. Action item: Building 298 construction drawings will be reviewed to determine how much soil may have been removed as part of construction of the foundation of the building. Retaining Building 310 as part of the cover (as provided in the FS Report) or removing Building 310 and placing a soil cover is a design consideration. Text will be added to the FS Report to indicate that removing Building 310 could be evaluated as part of the remedial design.

November 20, 2008 technical meeting

During the technical meeting, three major items were discussed and include conclusions of the RI to support the FS report, additional soil characterization to support a remedial design for OU2, and the removal action for Quarters S and N lead-contaminated soil.

General discussion: All were in agreement with the overall conclusions and recommendations in the draft Supplemental RI Report that supported the development of the remedial action objectives (RAOs) in the draft revised FS Report. In particular, the Navy and regulators are in agreement that there are unacceptable risks from exposure to soil at OU2 and that risks are acceptable for groundwater exposure and migration. Therefore, the RAOs in the draft revised FS Report for exposure to soil and erosion of soil to the offshore are acceptable. Also, no RAO is needed for migration of groundwater. Action item: No action needed.

General discussion: All were in agreement that sufficient data are available for OU2 to understand risks and identify and evaluate remedial alternatives. However, the regulators are concerned with several of the lead concentrations detected in samples that area adjacent to the west of the DRMO portion of OU2. Some of the concern is that truck, snow plow, and rail road traffic may have contributed to soil movement from highly contaminated areas within the DRMO

to these areas to the west. In addition, the Shipyard has information that shows that soil was removed from the area west of the DRMO and east of Building 348 as part of the construction of Building 348 (in the mid to later 1990s). It is not known whether the soil was contaminated from DRMO operations. The Navy is concerned that non-OU2 operations (general transportation activities or lead-based paint) may be the source of the lead in soils in these areas. Additional characterization of the lead concentrations in the areas west of the DRMO will be needed to determine the boundary of OU2 in this area before completion of a remedial action for OU2. Based on the results of the additional characterization, the Navy and regulators will need to make a management decision to determine the appropriate OU2 boundary. Action item: The Navy will obtain information on the soil removal and construction of Building 348, evaluate the impact to the understanding of contaminant distribution, and update the RI/FS reports as appropriate. The RI/FS reports will be revised to indicate that there is some uncertainty in several areas (around SS-02, SS-01, and SS-24) to the extent of lead concentrations that will need to be addressed as part of a pre-design or remedial design investigation.

General discussion: The Navy is planning to conduct a removal action for lead-contaminated soil in the backyards of Quarters S and N. The Navy has a contract in place for preparation of a work plan for soil removal. The Navy is planning to remove the top 1 to 2 feet of soil in the area adjacent to the north of the DRMO area and the top 0.5 foot of soil around Quarters N. An Action Memorandum for the removal action could be prepared and the draft final Action Memorandum provided for public comment to document the Navy's removal action for the residential portion of OU2. The work plan would be prepared at the same time as the Action Memorandum. Action item: The Navy and regulators will need to discuss further the appropriate depths for soil removal for the removal action and the appropriate mechanism for documenting the removal action.

November 20, 2008 RAB meeting presentation on the revised draft OU2 FS Report

There were various questions from community RAB members at the November 20, 2008 RAB meeting (see the RAB meeting minutes). Two items that were discussed during the meeting will be discussed further in the next version of the OU2 FS Report. These items included how sea water rise would be addressed as part of shoreline alternatives and consideration of green remediation as part of the evaluation of alternatives.

General discussion: During previous RAB meetings and public comment on remedial actions for OUs at Portsmouth Naval Shipyard, community members have expressed concerns for how rising sea water levels would be addressed as part of remedial actions. The question was also raised at the November 20, 2008 RAB meeting. The Navy indicated that the remedies are designed based on the 100-year flood plain. The operation and maintenance (O&M) program for the remedy provides the necessary inspection, evaluation, and maintenance activities that are needed to maintain the effectiveness of the remedy. Therefore, if there are changes in site conditions that may impact the effectiveness of the remedy, then the necessary action can be taken. The changes in sea water level that could impact the remedy would be addressed as part of the O&M program. Action item: The Navy will review the FS report text and add text as needed to indicate that an implemented remedy will be evaluated over time through the preparation and implementation of an O&M program, to ensure that the remedy remains effective when site conditions change over time.

General discussion: Green remediation is becoming an important consideration in the remedial alternative evaluation. Often the evaluation considers the energy consumption as part of

implementation of a remedy and may include options to reduce energy consumption. One way may be to evaluate ways to reduce the number of trucks coming on and leaving the site as part of remedial actions. Action item: The Navy includes evaluation of onsite treatment versus offsite disposal for two of the excavation alternatives. The Navy will provide further evaluation and discussion as appropriate in the next version of the FS concerning the use of energy during alternative implementation.

ATTACHMENT B

REVISED ALTERNATIVE DESCRIPTIONS

REVISED ALTERNATIVES FOR OPERABLE UNIT 2 (OU2) BASED ON REMEDIAL INVESTIGATION COMMENT RESOLUTION

Waste Disposal Area Alternatives

WDA-1 – No Action

WDA-2 – Land Use Controls (LUCs) and Monitoring

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

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

Defense Reutilization and Marketing Office (DRMO) Alternatives

DRMO-1 – No Action

DRMO-2 – LUCs and Monitoring

DRMO-3 – Residential Excavation with Off-yard Disposal, LUCs, and Monitoring

DRMO-4 – Construction Worker Excavation with Off-yard Disposal, LUCs, and Monitoring

DRMO-5 – Construction Worker Excavation and RCRA C Cap with Off-yard Disposal, LUCs, and Monitoring

Descriptions of the Waste Disposal Area (WDA) Alternatives

WDA-1 – No Action

This alternative is required under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) to establish a basis for comparison with other alternatives. No Action includes no controls, remediation, or other actions to mitigate risks. Five-year reviews are also not included under the No Action alternative.

WDA-2 – Land Use Controls (LUCs) and Monitoring

Alternative WDA-2 consists of instituting LUCs to prevent unacceptable human exposure to contaminated surface and subsurface soil across the 33,600 square foot area designated as the WDA. LUCs would be implemented to prevent unacceptable exposure to contaminated soil across the waste disposal area. In addition, Alternative WDS-2 would include groundwater monitoring and offshore sediment accumulation monitoring to provide confidence that contamination (lead, copper, and nickel) in waste material is not migrating to groundwater or the offshore area at unacceptable levels. The following describes the individual components of Alternative WDA-2:

- LUCs and Inspections – The intent of LUCs is to ensure that the land use and site features (buildings and shoreline stabilization) within a designated area do not changed and remain in place so that contact with contaminants at concentrations that would cause an unacceptable risk is prevented for the life of the remedy. To implement LUCs the Navy would prepare a LUC Remedial Design (RD) that would document the LUCs, operation and maintenance (O&M) requirements, inspection requirements, signage requirements, and organizations responsible for implementation of LUCs. Signage would consist of warning signs at the WDA to alert the public to the presence of contamination and dig restrictions. Requirements for management of excavated soil as part of any future construction activities at the site would also be included as part of the LUCs. Because the contamination associated with the waste disposal area is not located on the surface, fencing is not considered necessary for perimeter control. Lastly, implemented LUCs would require the continued presence of the shoreline stabilization along the entire length of the WDA to prevent the release of contaminated soil and debris to the near offshore area. For the purposes of the Feasibility Study (FS) and developing a cost estimate, it was assumed that annual inspections of the site would be conducted to verify continued effectiveness of the LUCs and that periodic minor repair of warning signs would be required, based on the results of annual site inspections.

- Groundwater Monitoring – A long-term management plan would be prepared to provide the requirements for groundwater monitoring including sampling frequency, location of wells, action levels, and monitoring exit strategy. For the purposes of the FS and developing a cost estimate, it was assumed that five existing monitoring wells would be sampled annually for 30 years, and the groundwater samples would be analyzed for lead, copper, and nickel.

- Offshore Sediment Accumulation Monitoring – A long-term management plan would be prepared to provide the requirements for the monitoring of accumulating offshore sediment. This plan would identify the frequency of inspections and the area in which the inspections would take place. For the purposes of the FS and developing a cost estimate, it was assumed that sediment accumulation monitoring would occur annually along the length of OU2. This plan will not include the analytical monitoring of any identified sediment. Any analytical monitoring of sediment would be performed under OU4.

- Five-Year Reviews – Because contamination would remain in excess of levels that allow for unrestricted use and unlimited exposure, five-year reviews would be required under this alternative to evaluate the continued adequacy of the remedy.

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

Alternative WDA-3 consists of excavation and off-yard disposal of soil and waste material from 0 to 2 feet below ground surface (bgs) within the proposed soil cover, off-yard disposal of soil and debris from the identified areas adjacent to the proposed soil cover limits, LUCs, and monitoring. This process would allow for the construction of a 2-foot-thick soil cover within the identified limits without changing the grades surrounding Building 310 or the grades of the associated parking and access features. This alternative would include instituting LUCs to identify Building 310 and the shoreline stabilization features as critical existing site features that must remain on site to ensure the integrity of the soil cover and to restrict unauthorized access to and digging within the proposed soil cover limits. In addition, groundwater monitoring and offshore sediment accumulation monitoring would be conducted to provide confidence that contamination (lead, copper, and nickel) in waste material is not migrating to groundwater at unacceptable levels. The following describes the individual components of Alternative WDA-3:

- Excavation and Off-yard Disposal – To provide a soil cover system constructed with surface elevations and grades that are the same as existing ground surface elevations, 2 feet of soil, including pavement, would be removed from the proposed limits of the soil cover system. Contaminated soil, and debris located outside the proposed soil cover system would be removed in their entirety so that no WDA-related soil or debris is located outside the proposed soil cover limits. All excavated material would be stockpiled, characterized, and properly transported and disposed off-yard. Confirmation samples would be collected from the floor and sidewalls of any excavation that is outside of the proposed cover system.

- Cover System – The cover system proposed for Alternative WDA-3 would consist of a geotextile to act as an indicator/separation layer, 18-inches of common fill (protection layer), and 6-inches of topsoil (protection and vegetative layer). Portions of the soil cover would be paved. The paved portions of the cover system would replace 9- to 12-inches of the top soil layers with a bituminous concrete mixture and base course designed to support the expected traffic loads for the area. Because the majority of the waste and soil contamination is located at depths below the mean high tide groundwater table elevation, an impermeable layer is not considered for this cover system.

- LUCs and Inspections – The intent of LUCs is to ensure that the land use and site features (soil cover, buildings, and shoreline stabilization) within a designated area do not changed and remain in place so that contact with contaminants at concentrations that would cause an unacceptable risk is prevented for the life of the remedy. To implement LUCs the Navy would prepare a LUC RD that would document the LUCs, soil cover system O&M requirements, cover system inspection requirements, signage requirements, and organizations responsible for the implementation of LUCs, O&M, and inspections. LUCs would also specify that additional action would be required in the event that Building 310 is removed from the site. Lastly, implemented LUCs would require the continued presence of the shoreline stabilization along the entire length of the WDA to prevent the release of contaminated soil and debris to the near offshore area. For the purposes of the FS and developing a cost estimate, it was assumed that annual inspections of the cover would be conducted to verify continued effectiveness of the remedy and periodic minor repair to the cover system and sign replacement would be required, based on the results of annual site inspections.

- Groundwater Monitoring – During implementation, groundwater monitoring wells would be protected such that they remain in place. Groundwater monitoring wells disturbed during excavation activities would be replaced following the excavation and cover system construction activities associated with this alternative. A long-term management plan would be prepared to provide the requirements for groundwater monitoring including sampling frequency, location of wells, action levels, and monitoring exit strategy. For the purposes of the FS and developing a cost estimate, it was assumed that five existing monitoring wells would be sampled annually for 30 years and the groundwater samples would be analyzed for lead, copper, and nickel.

- Offshore Sediment Accumulation Monitoring – A long-term management plan would be prepared to provide the requirements for the monitoring of accumulating offshore sediment. This plan would identify the frequency of inspections and the area in which the inspections would take place. For the purposes of the FS and developing a cost estimate, it was assumed that sediment accumulation monitoring would occur annually along the OU2 shoreline. This plan will not include the analytical monitoring of any identified sediment. Any analytical monitoring of sediment would be performed under OU4.

- Five-Year Reviews – Because contamination would remain in excess of levels that allow for unrestricted use and unlimited exposure, five-year reviews would be required under this alternative to evaluate the continued adequacy of the remedy.

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

Alternative WDA-4 consists of excavation and off-yard disposal of the soil and waste located above the mean high tide groundwater table within the limits of the WDA, LUCs, groundwater monitoring, and offshore sediment accumulation monitoring. Contaminated soil and waste, located above the mean high tide groundwater table and beneath Building 310, would remain in place. Once excavation is complete, the excavation would be backfilled with soil to return the area to pre-construction grades, elevations, and surface types. It is estimated that an average of 6-feet of clean soil (including pavement for parking and access) would be placed on top of waste material remaining in the saturated zone (remaining waste). This alternative would include instituting LUCs to identify Building 310 and the shoreline stabilization features as critical existing site features that must remain on site to ensure the integrity of the soil cover and to restrict unauthorized access and digging within the limits of the WDA, and groundwater monitoring and offshore sediment accumulation monitoring to provide confidence that contamination (lead, copper, and nickel) in waste material is not migrating to groundwater at unacceptable levels. The following describes the individual components of Alternative WDA-4:

- Excavation and Off-yard Disposal – Based on the depth of groundwater during a mean high tide, an average of 6 feet of soil and waste material would be excavated from the WDA area. Because the soil below Building 310 would remain, the excavation would extend to a depth of 2 feet adjacent to Building 310 and sloped away from the building so that the excavation does not affect the building's foundation (shoring would be used as appropriate). The 2 foot minimum excavation depth adjacent to the building would ensure the placement of 2 feet of clean soil over contaminated soil and debris that might remain below Building 310 following excavation. All excavated material would be stockpiled, characterized, and properly transported and disposed off-yard. Confirmation samples would be collected from the floor and sidewalls of the excavation areas to identify remaining contaminant concentrations. Due to the depth of excavation, the groundwater monitoring wells located within the limits of excavation would be abandoned during the excavation process.

- Backfilling and Cover System – The waste remaining below the groundwater table would be covered with an average of 6 feet of soil material and topsoil or bituminous concrete to establish pre-construction grades, elevations, and surface types. The difference between the WDA-3 cover system and the WDA-4 cover system is that no contaminated soil or waste, with the exception of any waste present under Building 310, would remain above the groundwater table for Alternative WDA-4.

- LUCs and Inspections – The LUCs and inspections proposed under Alternative WDA-4 would be the same as those presented for Alternative WDA-3.

- Groundwater Monitoring – With the exception of reinstalling abandoned monitoring wells, the groundwater monitoring proposed under Alternative WDA-4 would be the same as the groundwater monitoring presented for Alternative WDA-3. Based on the limits of excavation, it is assumed that four of the five existing groundwater monitoring wells would need to be replaced following the establishment of final grade.

- Offshore Sediment Accumulation Monitoring – The offshore Sediment accumulation monitoring proposed under Alternative WDA-4 would be the same as those presented under Alternative WDA-3.

- Five-Year Reviews – Because contamination would remain in excess of levels that allow for unrestricted use and unlimited exposure, five-year reviews would be required under this alternative to evaluate the continued adequacy of the remedy.

Description of Defense Reutilization and Marketing Office (DRMO) Alternatives

DRMO-1 – No Action

This alternative is required under CERCLA to establish a basis for comparison with other alternatives. No Action includes no controls, remediation, or other actions to mitigate risks. Five-year reviews are also not included under the No Action alternative.

DRMO-2 – LUCs and Monitoring

Alternative DRMO-2 would consist of instituting LUCs for the DRMO Area where soil contamination is causing an unacceptable risk based on residential exposure, conducting groundwater monitoring, and conducting sediment accumulation monitoring. This alternative would include instituting LUCs to identify the existing interim cap, Building 298, and the shoreline stabilization features as critical existing site features that must remain on site to ensure the integrity of the remedy, to restrict unauthorized access to and digging within the proposed soil cover limits, and to prevent unacceptable human exposure to contaminated surface and subsurface soil across the DRMO area. Groundwater monitoring and sediment accumulation monitoring would be conducted to provide confidence that contamination (lead, copper, and nickel) in soil is not migrating to groundwater or the OU2 offshore area at unacceptable levels. The following describes the components of Alternative DRMO-2:

- LUCs and Inspections – The intent of LUCs is to ensure that the land use and site features (buildings and shoreline stabilization) within a designated area do not changed and remain in place so that contact with contaminants at concentrations that would cause an unacceptable risk is prevented for the life of the remedy. To implement LUCs the Navy would prepare a LUC RD that would document the LUCs, O&M requirements, inspection requirements, signage requirements, and organizations responsible for implementation of LUCs. Signage would consist of warning signs in the DRMO area to alert the public to the presence of contamination and dig restrictions for the area. Requirements for management of excavated soil, as part of any future construction activities at the site, would also be included as part of the LUCs. It is assumed that existing asphalt or grass-covered areas would be maintained at the site and fencing would not be necessary as part of the remedy for perimeter control. Lastly, implemented LUCs would require the continued presence of the shoreline stabilization along the entire length of the DRMO to prevent the release of contaminated soil and debris to the near offshore area. For the purposes of the FS and developing a cost estimate, it was assumed that annual inspections of the site would be conducted to verify continued effectiveness of the LUCs and that periodic minor repair of warning signs and asphalt would be required, based on the results of annual site inspections.

- Groundwater Monitoring – A long-term management plan would be prepared to provide the requirements for groundwater monitoring including sampling frequency, location of wells, action levels, and monitoring exit strategy. For the purposes of the FS and developing a cost estimate, it was assumed that five existing monitoring wells would be sampled annually for 30 years, and the groundwater samples would be analyzed for lead, copper, and nickel.

- Offshore Sediment Accumulation Monitoring – A long-term management plan would be prepared to provide the requirements for the monitoring of accumulating offshore sediment. This plan would identify the frequency of inspections and the area in which the inspections would take place. For the purposes of the FS and developing a cost estimate, it was assumed that sediment accumulation monitoring would occur annually along the length of OU2. This plan will not include the analytical monitoring of any identified sediment. Any analytical monitoring of sediment would be performed under OU4.

- Five-Year Reviews – Because contamination would remain in excess of levels that allow for unrestricted use and unlimited exposure, five-year reviews would be required under this alternative to evaluate the continued adequacy of the remedy.

- Variance from Solid Waste Disposal Requirements – In order to leave the existing temporary cap in place under this alternative with no upgrades, a variance would have to be obtained from the State Solid Waste Management Division of MEDEP. The variance would include an equivalency determination that indicated that the existing interim cap meets the requirements of a permanent RCRA C cap.

DRMO-3 – Residential Excavation with Off-yard Disposal, LUCs, and Monitoring

Alternative DRMO-3 would consist of excavation and off-yard disposal of contaminated soil within the limits of the DRMO area that is causing an unacceptable risk, based on residential exposure, LUCs, and groundwater monitoring for soils left below Building 298. This alternative would include instituting LUCs to prevent unacceptable human exposure to contaminated soil left below Building 298. In addition, groundwater monitoring would be conducted to provide confidence that soil contamination left below Building 298 is not migrating to groundwater at unacceptable levels. The following describes the individual components of Alternative DRMO-3:

- Excavation and Off-yard Disposal – It is assumed for this FS that excavation to a depth of 6 feet within the DRMO area would achieve the required removal of contaminated soil to residential PRGs, excluding soil that is located beneath Building 298. Confirmation samples would be collected from the floor and sidewalls of the excavation areas to confirm that soil with concentrations greater than residential PRGs have been removed. The results of the confirmation sampling would direct further excavation, if needed. All excavated material would be stockpiled, characterized, and properly transported and disposed off-yard. The actual limits and depths of excavation would be determined by the results of the confirmation samples.

- Site Restoration – Following excavation, the area will be backfilled to establish pre-construction grades, elevations, and surface types using clean soil.

- LUCs– Because this alternative does not include the demolition of Building 298, contaminated material may remain on site following the implementation of this alternative. Therefore, following the completion of the excavation activities, the Navy would institute LUCs to restrict access to the soil within the footprint of Building 298. The Navy would prepare a LUC RD that would document the LUCs, O&M requirements, inspection requirements, signage requirements, and organizations responsible for implementation of LUCs, as needed. By removing the contamination causing an unacceptable residential risk, the shoreline stabilization revetment on the western end of the DRMO area extending to Building 298 would not be required to prevent the erosion of this soil. For this alternative, LUCs would not require shoreline stabilization for this portion of the site. However LUC inspections would require the verification that Building 298 remains for the life of the remedy.

- Groundwater Monitoring – During implementation, the groundwater monitoring well established to evaluate migration of contamination from soil under Building 298 to groundwater would be protected or abandoned and replaced following the alternative implementation. Monitoring of groundwater would be conducted until it has been decided that migration of lead, copper, and nickel contamination from soil would not result in groundwater concentrations greater than acceptable levels for human health and the environment. A long-term management plan would be prepared to provide the requirements for groundwater monitoring including sampling frequency, action levels, and groundwater monitoring exit strategy. For the purposes of the FS and developing a cost estimate, it was assumed that two monitoring wells would be designated to evaluate migration of contamination from soil under Building 298 to groundwater, would be sampled annually for 30 years, and analyzed for lead, copper, and nickel.

- 5-Year Reviews – Because contamination may be present under Building 298 and because this contamination would remain in excess of levels that allow for unrestricted use and unlimited

exposure, five-year reviews would be required under this alternative to evaluate the continued adequacy of the remedy.

DRMO-4 – Construction Worker Excavation with Off-yard Disposal, LUCs, and Monitoring

Alternative DRMO-4 consists of partial excavation and off-yard disposal of DRMO area soil that is causing an unacceptable risk based on construction worker exposure, LUCs, groundwater monitoring, and sediment accumulation monitoring. This alternative would include instituting LUCs to identify Building 298 and the shoreline stabilization features as critical existing site features that must remain on site to ensure the integrity of the remedy, to restrict unauthorized access to and digging within the proposed soil cover limits, and to prevent unacceptable human exposure to contaminated surface and subsurface soil across the DRMO area. Groundwater monitoring and sediment accumulation monitoring would be conducted to provide confidence that contamination (lead, copper, and nickel) in soil is not migrating from the contaminated soil left in place to groundwater at unacceptable levels. Based on the distribution of COCs, soil containing concentrations of lead greater than 4,000 milligram per kilogram (mg/kg) and the entire limits of the interim cap represent the limits of this proposed remedial action. The following describes the individual components of Alternative DRMO-4:

- Excavation and Off-yard Disposal – It is assumed for this FS that an average excavation depth of 6 feet within the DRMO area would achieve the required removal of contaminated soil to construction worker PRGs. Based on the distribution of COCs, soil containing concentrations of lead greater than 4,000 mg/kg and the entire limits of the interim cap represent the limits of excavation for this alternative. Confirmation samples would be collected from the floor and sidewalls of the excavation areas to confirm that soil with concentrations greater than construction worker PRGs have been removed. The actual limits and depths of excavation would be determined by the results of the confirmation samples.

- Site Restoration – Following excavation, the excavated areas would be backfilled to establish pre-construction grades, elevations, and surface types, using clean soil and pavement where necessary. The area that currently contains the interim cap would be restored to grades that promote positive drainage and match the surrounding grades of the DRMO area.

- LUCs and Inspection – Because this alternative does not include excavation to residential exposure criteria or the demolition of Building 298, contaminated material would remain on site following the implementation of this alternative. As a result, LUCs would be instituted over the entire DRMO area; the LUCs proposed under Alternative DRMO-4 would be the same as those presented for Alternative DRMO-2.

- Groundwater Monitoring – Contaminated material from the interim capped area would be removed under this alternative; however, because this alternative does not include excavation to residential exposure criteria or the demolition of Building 298, contaminated material would remain on site following the implementation of this alternative. During implementation, groundwater monitoring wells would be protected such that they remain in place or are abandoned and replaced following the remedial action associated with this alternative. Monitoring of groundwater would be conducted until it has been decided that migration of lead, copper, and nickel contamination from soil would not result in groundwater concentrations greater than acceptable levels for human health and the environment. A long-term management plan would be prepared to provide the requirements for groundwater monitoring including sampling frequency, location of wells, action levels, and monitoring exit strategy. For the purposes of the FS and developing a cost estimate, it was assumed that two monitoring wells down gradient of Building 298 would be sampled annually for 30 years and three monitoring wells at the DRMO would be sampled annually for 5 years. All groundwater samples would be analyzed for lead, copper, and nickel.

- Offshore Sediment Accumulation Monitoring – Because this alternative does not include excavation to residential exposure criteria or the demolition of Building 298, contaminated material would remain on site following the implementation of this alternative. As a result, the offshore sediment accumulation monitoring activities proposed under Alternative DRMO-4 would be the same as those presented for Alternative DRMO-2.

- 5-Year Reviews – Because contamination may be present under Building 298 and because this contamination would remain in excess of levels that allow for unrestricted use and unlimited exposure, five-year reviews would be required under this alternative to evaluate the continued adequacy of the remedy.

DRMO-5 – Construction Worker Excavation and RCRA C Cap with Off-yard Disposal, LUCs, and Monitoring

Alternative DRMO-5 consists of excavation and off-yard disposal of soil that is causing an unacceptable risk based on construction worker exposure, constructing a permanent RCRA C cap system over the area where the current interim cap is constructed, LUCs, groundwater monitoring, and offshore sediment accumulation monitoring. This alternative would include instituting LUCs to identify Building 298 and the shoreline stabilization features as critical existing site features that must remain on site to ensure the integrity of the remedy, to restrict unauthorized access to and digging within the proposed soil cover limits, and to prevent unacceptable human exposure to contaminated surface and subsurface soil across the DRMO area. Groundwater monitoring and sediment accumulation monitoring would be conducted to provide confidence that contamination (lead, copper, and nickel) in soil is not migrating to groundwater at unacceptable levels. The remedial action limits for Alternative DRMO-5 are the same as those in Alternative DRMO-4. The following describes the individual components of Alternative DRMO-5:

- Excavation and Off-Yard Disposal – Alternative DRMO-5 consists of excavating the soil identified in Alternative DRMO-4 outside the limits of the interim cap and transporting this material to an off-yard disposal facility. Confirmation samples would be collected from the floor and sidewalls of the excavation areas to confirm that soil with concentrations greater than construction worker PRGs have been removed.

- Site Restoration – Following excavation, the excavated area would be backfilled to establish pre-construction grades, elevations, and surface types using clean soil and pavement.

- RCRA C Cap System – The cap system would be constructed over the limits of the current interim cap and the area between the existing interim cap and Building 298. The RCRA C cap would be constructed to meet the requirements established for the closure of landfills within the State of Maine. These requirements, with the exception of sloping and drainage, were implemented in the construction of the interim cap currently located within the limits of the DRMO. Therefore, the proposed cap for this alternative contains the same components as the interim cap, with revised slopes and upgraded drainage. Based on the contamination below the interim cap (lead), it is not anticipated that a gas management layer would be required for the cap system in this FS. However, if a determination is made during design preparations that a gas management layer is needed, grading can easily be altered to allow for the incorporation of a passive gas removal system. The cap system would consist of a geotextile cushioning layer placed on the regraded material, a geocomposite clay liner (GCL) to act as a low permeability layer, a second geotextile cushioning layer above the GCL, and a 2-foot-thick soil cover to protect the GCL, provide a geonet drainage layer, and to support vegetation. A cap system, rather than a cover system, would be used for the DRMO areas because most of the contamination associated with the DRMO area is located above the average high tide groundwater elevation.

- LUCs and Inspections – Because this alternative does not include the removal of all contamination causing a residential risk or the demolition of Building 298, contaminated material would remain on site following the implementation of this alternative. Therefore, following the completion of the

excavation activities, the Navy would institute LUCs to restrict access to the soil across the limits of the DRMO area, including the footprint of Building 298. The Navy would also institute LUCs to restrict the use of the area to its current use and restrict future uses of the remaining DRMO area to protect the integrity of the RCRA C cap. The Navy would prepare a LUC RD that would document the LUCs, soil capping system O&M requirements, capping system inspection requirements, signage requirements, and organizations responsible for the implementation of LUCs. Lastly, implemented LUCs would require the continued presence of the shoreline stabilization along the entire length of the DRMO to prevent the release of contaminated soil and debris to the near offshore area. For the purposes of the FS and developing a cost estimate, it was assumed annual inspections of the cover would be conducted to verify continued effectiveness of the remedy and periodic minor repair to the cover system would be required, based on the results of annual site inspections.

- Groundwater Monitoring – During implementation, groundwater monitoring wells would be protected such that they remain in place or are abandoned and replaced following the removal action associated with this alternative. Monitoring of groundwater would be conducted until it has been decided that migration of lead, copper, and nickel contamination from soil would not result in groundwater concentrations greater than acceptable levels for human health and the environment. A long-term management plan would be prepared to provide the requirements for groundwater monitoring including sampling frequency, location of wells, action levels, and monitoring exit strategy. For the purpose of the FS and developing a cost estimate, it was assumed that five monitoring wells would be sampled annually for 30 years. All groundwater samples would be analyzed for lead, copper, and nickel.

- Offshore Sediment Accumulation Monitoring – Because this alternative does not include excavation to residential exposure criteria or the demolition of Building 298, contaminated material would remain on site following the implementation of this alternative. As a result, the offshore sediment accumulation monitoring activities proposed under Alternative DRMO-5 would be the same as those presented for Alternative DRMO-2.

- Five-Year Reviews – Because contamination would remain within site soil at concentrations greater than concentrations that would allow for unrestricted use of the site and unlimited exposure to site soil, five-year reviews would be required under this alternative to evaluate the continued adequacy of the remedy.

ATTACHMENT C

REVISED SECTIONS 1 AND 2 AND TABLES 2-1, 2-2, AND 2-3

1.0 INTRODUCTION

1.1 PURPOSE OF REPORT

This Feasibility Study (FS) Report for Operable Unit (OU) 2 at Portsmouth Naval Shipyard (PNS), Kittery, Maine, was prepared by Tetra Tech NUS, Inc. (TtNUS) for the United States Department of the Navy, Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic under the Comprehensive Long-Term Environmental Action Navy (CLEAN) program, Contract Number N62467-04-D-0055, Contract Task Order (CTO) 444. This report describes the formulation and evaluation of remedial alternatives to address the unacceptable risks at OU2 based on the results of the Supplemental Remedial Investigation (RI) Report for OU2 (TtNUS, ~~September 2008~~March 2010). This FS was prepared to fulfill the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act. As required by CERCLA, primary consideration is given to remedial alternatives that provide adequate protection of human health and the environment and alternatives that attain or exceed the regulatory requirements and guidance that may potentially govern remedial activities (see Section 2.0). Therefore, in addition to CERCLA requirements, this FS was also prepared with consideration of other regulatory requirements and guidance, as appropriate.

1.2 SCOPE AND OBJECTIVES

The purpose of this FS is to address the contamination and OU2 site risks for exposure to soil, future potential groundwater migration, and future potential soil erosion~~in surface and subsurface soil at OU2~~. OU2 consists of Site 6 – the Defense Reutilization and Marketing Office (DRMO) Storage Yard, the DRMO impact area, and Site 29 – Former Teepee Incinerator Site. Throughout the remainder of this FS, Site 6 and portions of Site 29 are referred to as the DRMO area and the remainder of Site 29 is referred to as the ~~W~~waste ~~D~~disposal aArea. The alternatives were developed in this FS based on the conclusions and recommendations presented in the OU2 Supplemental RI Report. This FS provides an evaluation of ~~soil~~ remedial alternatives to address unacceptable risks for OU2. The evaluation included options ~~In addition, this FS provides an evaluation of shoreline stabilization alternatives~~ to protect the offshore area ~~(offshore area is part of OU4)~~ from potential impacts associated with OU2 contamination; however, ~~.~~ ~~T~~the ~~O~~contamination in the offshore area adjacent to OU2 will not be addressed as part of OU2. The offshore area is included in the DRMO Storage Yard area of concern of OU4. Based on the risk evaluation in the OU2 Supplemental RI Report, exposure to groundwater does not pose unacceptable risks for OU2 receptors ~~based on current conditions. is not a medium of concern for OU2.~~

The FS was conducted to establish Remedial Action Objectives (RAOs), to screen remedial technologies, and to assemble, evaluate, and compare remedial alternatives that will be used in selecting a remedial action for OU2. A Proposed Remedial Action Plan, submitted after the FS is finalized, will provide the Navy's recommended remedial action for OU2 and will be prepared based on the information provided in the FS. Lastly, the contamination identified in the residential area located north of the DRMO is not included in ~~this~~ the FS because ~~.~~ Aa removal action will be conducted to remediate contamination in this area. The Action Memorandum for Non-Time-Critical Removal Action for OU2 DRMO Impact Area (Navy, November 2009) provides information on the removal action for the residential area in OU2.~~has been scheduled for this area.~~

This FS fulfills the requirements of CERCLA and is consistent with United States Environmental Protection Agency (USEPA) Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (USEPA, October 1988) and the Navy Environmental Restoration Program (NERP) Manual, Chapter 8, Remedial Investigation/Feasibility Study (Navy, August 2006).

1.3 REPORT ORGANIZATION

This report has been divided into the following five sections:

- Section 1.0 – Introduction: This section provides a description of the purpose, scope, and objectives of the FS. This section also provides a summary of background information and the OU2 Supplemental RI Report.
- Section 2.0 – Remedial Action Objectives: This section presents Applicable or Relevant and Appropriate Requirements (ARARs), the medium of concern, RAOs, preliminary remediation goals (PRGs), and areas and volumes of soil to be addressed by the remedial alternatives for OU2.
- Section 3.0 – Identification and Screening of Technologies and Development of Alternatives: This section discusses the general response actions (GRAs) identified to attain the RAOs, the screening of technology types and process options, description and evaluation of technologies, and development of alternatives.
- Section 4.0 – Description and Detailed Analysis of Remedial Alternatives: This section describes the conceptual design of the alternatives and discusses the detailed analysis of alternatives using the seven criteria of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). ~~Section 4.0 also includes the description and detailed analysis of the shoreline stabilization alternatives.~~

- Section 5.0 – Comparative Analysis of Alternatives: This section provides a comparison of the alternatives using the detailed analysis information in Section 4.0.

Appendix A provides supporting information including a discussion of PRG development and calculations used in the development and evaluation of remedial alternatives. Appendix B provides alternative-specific ARARs tables. Appendix C provides the cost estimates for the alternatives. Appendix D includes area and quantity calculations. Appendix E includes the soil washing pilot studies performed at OU2. Appendix F ~~will~~ includes responses to comments on the draft and draft final documents, as appropriate. ~~Minutes from technical meetings to resolve comments on the draft and draft final document will also be included in Appendix F.~~

1.4 FACILITY AND OU2 BACKGROUND INFORMATION

A description of PNS and the history of the facility, as well as a description and history of OU2, are provided in this section.

1.4.1 Facility Description and History

PNS is a military facility with restricted access on an island located in the Piscataqua River, as shown on Figure 1-1. PNS is referred to on National Oceanic and Atmospheric Administration (NOAA) nautical charts as Seavey Island, with the eastern tip given the name Jamaica Island. Clark's Island is to the east attached by a rock causeway to Seavey Island. The Piscataqua River is a tidal estuary that forms the southern boundary between Maine and New Hampshire. PNS is located in Kittery, Maine, north of Portsmouth, New Hampshire, at the mouth of the Great Bay Estuary (commonly referred to as Portsmouth Harbor).

PNS is engaged in the conversion, overhaul, and repair of submarines for the Navy. The long history of shipbuilding in Portsmouth Harbor dates back to 1690, when the first warship launched in North America, the Falkland, was built. PNS was established as a government facility in 1800, and it served as a repair and building facility for ships during the Civil War. The first government-built submarine was designed and constructed at PNS during World War I. A large number of submarines have been designed, constructed, and repaired at this facility since 1917. PNS continues to service submarines as its primary military focus.

Prior to CERCLA and Resource Conservation and Recovery Act (RCRA) regulation at PNS, years of shipbuilding and submarine repair work at PNS resulted in hazardous substances being released into soil, groundwater, surface water, and sediment on and around Seavey Island. As a result, investigation and remediation activities were performed under the Department of Defense (DoD) Installation Restoration Plan

(IRP). Paralleling CERCLA, the IRP focuses on the cleanup of contamination from past hazardous waste operations and past hazardous material spills. The IRP is further discussed in the Site Management Plan (SMP) for PNS [Amended Fiscal Year (FY) ~~08~~10] (Navy, ~~March 2008~~February 2010).

Investigations of hazardous substance releases at PNS began in 1983 with the Initial Assessment Study (IAS) (Weston, June 1983). 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 RCRA. Since 1988, Maine Department of Environmental Protection (MEDEP) has also provided oversight of investigation and remediation at PNS. In March 1989, USEPA issued a Corrective Action Permit under the RCRA Hazardous and Solid Waste Amendments (HSWA) of 1984 (USEPA, March 1989) that required PNS to investigate 13 Solid Waste Management Units (SWMUs) and take appropriate corrective action. Until the mid-1990s, investigations at PNS were conducted under RCRA authority. Effective May 31, 1994, PNS was included on the National Priorities List (NPL), and subsequent studies have been conducted under the authority of CERCLA, commonly known as Superfund. Consistent with the transition from RCRA to CERCLA, the SWMU terminology was replaced with "site." Ongoing work meets the intent of the HSWA Permit, but the ongoing studies to develop and evaluate remedial activities are conducted as part of FSs (CERCLA terminology) and combine both RCRA and CERCLA criteria.

The Federal Facility Agreement (FFA) for PNS was signed by USEPA and the Navy in September 1999, became effective February 2000, and supersedes the HSWA Permit. The State of Maine has elected not to be a party to the FFA at this time. However, the state is afforded a participatory role in the site remediation process by virtue of CERCLA. Among other things, the FFA outlines roles and responsibilities, establishes deadlines/schedules, outlines work to be performed, and provides a dispute resolution process for primary documents. The FFA for PNS ensures that CERCLA decisions will be consistent with RCRA and other federal and state hazardous waste statutes and regulations as appropriate for the sites at PNS. USEPA, MEDEP, and the Navy continue to work toward site cleanup at PNS under CERCLA.

1.4.2 OU2 Description

OU2 is located in the south-central portion of PNS along the Piscataqua River as shown on Figure 1-1. OU2 consists of Site 6 – DRMO Storage Yard and Site 29 – Former Teepee Incinerator Site. The DRMO impact area (Quarters S, N, and 68) was included in OU2 because this area was thought to be impacted by particulate deposition from DRMO Storage Yard activities. The general layout of OU2 is shown on Figure 1-2. Because OU2 is on the shoreline, OU2 is adjacent to OU4, the offshore area.

OU2 currently and historically included residential (Quarters S, N, and 68) and industrial/occupational (DRMO and Dumpster Storage Areas; Building 298, and Building 310) areas. The following provides a description of current site features.

The current DRMO Storage Yard area is the fenced area south of Quarters S and N and west of Building 298. The DRMO Storage Yard is responsible for the reuse, transfer, donation, sale, or disposal of excess and surplus DoD property in New England. DRMO Storage Yard operations are conducted in the paved portion of the fenced area. The interim capped area (formerly used for DRMO operations) adjacent to the area currently used as the DRMO storage area is covered with grass. The interim capped area is barricaded (by jersey barriers) and restricted from DRMO use and activities. The current operations use temporary trailers and buildings; there are no permanent buildings located at the DRMO Storage Yard. Dumpsters for solid wastes are stored in the fenced area west of the DRMO Storage Yard. Two buildings are located in the Site 29 area; Building 298 is used for office space, and Building 310 is a hose-handling facility. There are no hazardous waste-related activities at OU2, and hazardous chemicals are not used as part of any of the current operations at OU2.

The DRMO Storage Yard, dumpster storage area, and areas surrounding Building 298 and west of Building 310 are paved. The areas north, east, and south of Building 310 are covered with vegetation. The DRMO Storage Yard and Buildings 298 and 310 are located in a relatively flat area, approximately 10 to 30 feet lower than the surrounding area (including Quarters S, N, and 68) ~~to the~~ north and approximately 10 to 50 feet lower than the area ~~to the~~ north/~~northwest~~ northeast of Building 310. There is a steep slope ~~between the area to the~~ north and northwest~~east~~ of Building 310 and the OU2 area. ~~This~~; the area is wooded, and bedrock outcrops are visible among the trees. Most of OU2 is located on filled land as defined by the 1901 shoreline and the current shoreline (shown as the mean low water line) on Figure 1-2. Quarters S, N, and 68 are used as military residences and are located on the original island (defined by the 1901 shoreline). Building 348, located to the west of the DRMO Storage Yard, is a shredder facility that was built in the 1990s. An inactive reservoir is located northeast of Building 310.

The OU2 shoreline is steeply sloped and has shoreline erosion controls including riprap along the DRMO Storage Yard shoreline, south of Building 298, and southeast of Building 310, and a seawall along the shoreline south of Building 310. As part of shoreline stabilization to prevent site soils from eroding, r~~R~~iprap was placed along portions of the OU2 shoreline in 1999, 2005, 2006, and 2008. The seawall is approximately 12 feet high and appears to be constructed of base layers of stone blocks on which a concrete wall was poured. The seawall has been in place since the 1940s. There is a small intertidal depositional area to the east of OU2. A sediment and mussel sampling location at Monitoring Station (MS) 11 of the Interim Offshore Monitoring Program for OU4 is in this depositional area, and two mussel

sampling locations at MS-11 are located in the central portion of the OU2 shoreline (TtNUS, November 2004). The boundary of MS-11 (see Figure 1-2) defines the boundary of the DRMO Storage Yard.

1.4.3 OU2 History

The area occupied by OU2 was originally known as Henderson's Point, named after a portion of land that was removed in the early 1900s. Before the 1990s, the area now identified as Site 29 was considered part of the DRMO Storage Yard (Site 6). The main activities that occurred at Site 6 were related to DRMO Storage Yard operations, and the main activities that occurred in the Site 29 area were related to open burning, industrial incineration, and waste disposal, as discussed below. Historical information on OU2 was mainly obtained from the IAS (Weston, June 1983), a report on the history of the DRMO Storage Yard area prepared by the Shipyard (PNS, January 1997), and review of historical maps.

Before filling began in the area, Quarters S and N were located near the historical (1901) shoreline in a generally residential area. The majority of the filling in the area was conducted between 1902 and 1908 with material from the excavation of Henderson's Point. The excavated material from Henderson's Point apparently included excavated soil, gravel, and rock fragment and wood from a cofferdam. Other debris (including material such as wood from removed structures) generated during the excavation activities was also apparently included in the fill material. Additional filling was conducted periodically throughout the history of site usage.

The first reported use of the DRMO Storage Yard area was for a stone crusher facility (Building 145) used from 1919 until the 1950s when the building was demolished. The stone crusher facility was located southeast of Building 172. The DRMO Storage Yard was established in 1920. Materials reportedly stored at the DRMO Storage Yard included lead and nickel-cadmium battery elements, motors, typewriters, paper products, and scrap metal. The major hazardous materials of concern were the lead battery cells and plates that were stockpiled on uncovered pallets. Nickel-cadmium batteries were also stored in this manner. Scrap metal storage was conducted in Building 146 until 2000, and the building was demolished around 2003.

Historically, DRMO Storage Yard operations primarily appear to have occurred in the current fenced area of the DRMO Storage Yard (including the interim capped area), but operations could have occurred in adjacent areas. Additional information obtained from the Shipyard in 2008 shows that DRMO activities were conducted in what is referred to as the dumpster storage area and adjacent to the south of Building 348. When railroad lines were used to transport materials to and from the DRMO, loading and offloading of these materials also occurred in the area south of Building 348, near the DRMO entrance. Snow plowing in the DRMO Storage Yard also appears to have pushed equipment or pieces of stored materials to adjacent areas, including the offshore area. For example, scrap metal has been observed in the area

north of Building 146, and parts of batteries were observed along the shoreline ~~before shoreline controls were placed~~. In addition, scrap metal was stored in large piles within the DRMO Storage Yard (adjacent to the DRMO Storage Yard fence by Building 146 and in the interim capped area before it was capped in 1993), and pieces of scrap metal may have been moved to areas adjacent to the DRMO Storage Yard during site operations. Activities such as open storage of batteries and other materials, that could have caused contaminants to be leached or otherwise released by pathways, such as infiltration or runoff, were terminated in approximately 1983. In 1993, interim corrective measures were conducted for a portion of the DRMO Storage Yard and included the capping and paving of unpaved areas and installation of storm water controls in the interim of a final remedy. Open storage of scrap metal in large piles was discontinued before the interim cap was installed. Snow plowing to the offshore area was discontinued in the 1980s or 1990s. In 1991, the Shipyard conducted soil removal from what is now the dumpster storage area. Soil was excavated to a depth where rock (large boulders) was encountered, the excavation backfilled with soil and the area paved, and the excavated material was disposed off base. The exact area of the soil removal in the dumpster storage area is not known.

Filling of the remaining portion of OU2, referred to as the ~~W~~waste ~~D~~disposal ~~A~~area, may have begun in the 1920s. This area was filled with paper, wood, rubbish, and ash. The ash is reportedly from open burning of trash that was conducted in the waste disposal area from approximately 1918 until 1965, when the ~~T~~teepee ~~I~~incinerator was built. Ash from the ~~Teepee I~~incinerator was also disposed in the ~~W~~waste ~~D~~disposal ~~A~~area. Onsite disposal ended around 1975 when offsite disposal of trash began. Materials identified in soil borings located in the ~~W~~waste ~~D~~disposal ~~A~~area are generally consistent with the background information and include ash, cinders, wire, glass, wood, and metal pieces. Asbestos was also found in the waste disposal area during excavation of the Building 310 foundation.

Metallic debris observed in surface soil near the bedrock outcrop east of Building 310 is likely from the waste disposal area and was relocated during grading that occurred during the construction of Buildings 298 and 310.

The ~~T~~teepee ~~I~~incinerator (Building 290) was built in 1965 and used to burn waste materials until 1975. The incinerator was used primarily for the disposal of wood, paper, and rubbish, with occasional burning of cans of paint and solvents. Ash from the incinerator was deposited south of the incinerator (in the ~~W~~waste ~~D~~disposal ~~A~~area) until 1971 when the incinerator residue began to be landfilled in the Jamaica Island Landfill (OU3, located approximately 1,000 feet northeast of OU2) and the Kittery municipal landfill. The incinerator ceased operations in 1975 and was demolished soon after operations ended.

Building 298 was built in 1975 and was used as an industrial waste water treatment facility until the 1980s. Clean closure under RCRA was documented in May 1997 and accepted by MEDEP in November

1997. The building is currently used as office space. In 2002, the Shipyard excavated a utility trench to place new utilities to service the offices. The excavated soil was disposed off base, the trench was backfilled with clean fill material, and the trench is considered a clean area within the OU2 boundary.

There is a steep hill north of the concrete wall north of Building 298 and northeast of Building 172 (former sandblast grit storage hopper). The top of the hopper is at the top of the hill. Historical information for OU2 does not indicate that this hill was used for storage activities as part of the DRMO or that open burning occurred near this area.

Building 310 was built in 1980 as a hose-handling facility and continues to be used for this purpose. Building 314 was used as a pesticide-handling facility from 1982 until 1995 and was demolished in 1998. There have been no reported releases from either facility.

Shoreline stabilization along the OU2 shoreline was conducted in 1999, 2005, 2006, and 2008 as part of emergency actions to cover eroding soils along the top of the shoreline.

Other structures related to the general use of the area are the railroad lines and roads that have been in the area since approximately 1910. Railroad lines were used at the site from the mid- to late 1910s until the interim capping of a portion of the DRMO Storage Yard in 1993. The railroad lines ran along John Paul Jones Avenue to Building 146 since the 1910s, to the ~~W~~waste ~~D~~disposal ~~A~~area since the 1920s, and to the ~~Teepee~~ incinerator since the 1960s. Portions of the railroad were removed when Buildings 298 and~~,~~ 310, and the interim cap were constructed. The main road to the OU2 area from approximately 1915 to the 1960s or 1970s appears to be an extension of Sloat Avenue, which runs south between former aboveground tanks (see Figure 1-2) and ends at Quarter N/Seavey Avenue. The extension ran east to Quarter X and Building 302 and was the main access road to buildings east of Quarter X. Seavey Road was built in the 1950s, and portions of the extension of Sloat Avenue and Quarter R (located west of Quarter X) were paved for parking in the 1960s. There were also access roads to Building 145 and a building directly south of Quarter R in the 1940s. The area where the main road was located is now a parking area, and Lanman Street is now located between the former locations of these access roads. A road also ran west of Quarter S to Building 146 in the 1930s and 1940s.

Additional information on the historical filling and uses of OU2 and historical maps are provided in the OU2 Supplemental RI Report (TtNUS, ~~September 2008~~March 2010).

1.5 SUMMARY OF OU2 ENVIRONMENTAL INVESTIGATIONS AND ACTIONS

Environmental samples were collected at OU2 as part of the following investigations:

- Final Confirmation Study (FCS) in 1984 (LEA, June 1986)
- RCRA Facility Investigation (RFI) in 1989 to 1992 (McLaren/Hart, July 1992)
- RFI Data Gap Investigation in 1994 (Halliburton NUS, November 1995)
- Groundwater monitoring from 1996 to 1997 (TtNUS, August 1999)
- Field Investigation at Site 29 in 1998 (TtNUS, March 2000)
- Removal Action at Site 6 in 1999 (FWENC, June 2001)
- Soil Washing Treatability Study in 2004 and 2005 (TtNUS, January 2006)
- Additional Investigation including Soil Washing Treatability Study in 2007 and 2008 (~~AE, April 2008~~TtNUS, August 2008)
  ~~OU2 Supplemental Remedial Investigation in 2007 and 2008 (TtNUS, September 2008)~~

Environmental samples have also been collected in the offshore areas of OU2. These samples were collected as part of the following investigations:

- Estuarine Ecological Risk Assessment (EERA) in 1991 to 1993 (NCCOSC, May 2000)
- Interim Offshore Monitoring Program from 1999 to 2003 (TtNUS, November 2004)
- Additional Scrutiny Investigation in 2005 (TtNUS, August 2007).

Lastly, soil samples were also collected to support the Shipyard's utility trench excavation for Building 298 in 2002 (TtNUS, November 2005). Soil sampling locations are shown on Figure 1-3, and groundwater and offshore sampling locations are shown on Figure 1-4.

The following interim and/or removal actions were also conducted at OU2. These actions included;

- Capping and paving of sections of the DRMO Storage Yard area and construction of storm water controls and concrete curbing as part of an interim action in 1993 (McLaren/Hart, April 1993).
- Emergency removal actions to stabilize the shoreline along the DRMO Storage Yard in 1999 (FWENC, June 2001).
- Shipyard u~~U~~tility trench excavation in 2002 (TtNUS, November 2005).
- ~~Construction of shoreline stabilization controls~~Emergency removal actions to stabilize the shoreline at Site 29 in 2005~~, and~~ 2006, and 2008 (TtEC, October 2005, and June and July 2008).

~~Removal action in 2006.~~

~~Shoreline stabilization upgrades in 2008 (TtEC, June 2008)~~

Prior to the 2002 utility trenching, TtNUS collected soil samples from borings within the planned trench excavation area. The borings showed boulders, rocks, and fill material similar to the material from excavation of Henderson's Point. Subsequently, the Shipyard excavated a trench to 4 feet below ground surface (bgs), a geotextile fabric was placed in the trench, and the utilities were placed on the geotextile fabric. The excavated soil was disposed off base, the trench was backfilled with clean fill material, and the trench is considered a clean area within OU2 (TtNUS, November 2005).

In 2004, three test pits in the interim capped area, one test pit near DSB-07, and one test pit in the waste disposal area were excavated for collection of large-volume soil samples for a bench-scale soil washing treatability study. The test pits in the interim capped area and near DSB-07 were terminated at approximately 5 to 9 feet bgs because large-size (greater than 2 feet in diameter) rock fragments were encountered, making further excavation difficult, or there was no recoverable soil material. The test pit in the waste disposal area was terminated at approximately 6 feet bgs when groundwater was encountered (TtNUS, January 2006).

After completion of the various investigations, including risk assessment, at OU2, the Navy submitted a draft OU2 FS in November 2004. Based on regulatory and Restoration Advisory Board (RAB) comments, the Navy determined that additional investigation was necessary to better define the nature and extent of contamination for development of RAOs and to assist the Navy in refining risk-based remediation areas and cost estimates for the alternatives evaluated in the FS. The major additional data needs identified were related to better delineation of the spatial extent of soil contamination at OU2 [primarily lead and total polychlorinated biphenyls (PCBs)] to determine remediation areas and better understanding of groundwater migration in the portion of OU2 downgradient of the areas of highest soil contamination. The OU2 Additional Investigation Quality Assurance Project Plan was prepared by TtNUS (TtNUS, October 2007), and the investigation was conducted in 2007 and 2008. The Additional Investigation included soil boring and groundwater well installation, soil, groundwater, and surface water sampling, and test pitting. Large-volume soil samples were also collected from the test pits for a bench-scale soil washing treatability testing (TtNUS, ~~September~~ August 2008).

The OU2 offshore area is being evaluated as part of OU4. Based on data from Rounds 1 through 7 of the Interim Offshore Monitoring Program, it was determined that additional scrutiny was needed to address elevated metals (copper, lead, and nickel) concentrations in sediment at MS-11 offshore of OU2. Soil eroding along the top of the Site 29 shoreline was sampled in 2005 as part of additional scrutiny for MS-11. As concluded in the Additional Scrutiny Report for OU4 (TtNUS, August 2007), ~~T~~the data showed that the eroding soil was likely the cause of the elevated metals concentrations observed in nearby

offshore sediments, and shoreline controls were subsequently placed along the nearby shoreline in 2005 and 2006. Because there is very little sediment in the depositional area (sediment can only be collected at very low tide by scooping sediment around rocks) and because erosion controls were placed along the shoreline (2005 and 2006), it was agreed that additional sampling to determine the extent of sediment contamination and removal of sediment were not required (TtNUS, August 2007). As part of the preparation of the OU2 Additional Investigation QAPP (TtNUS, October 2007), it also was also agreed that additional sediment sampling was not needed to support the OU2 RI.

The data from previous investigations and information from the removal actions were used to evaluate site characteristics, the nature and extent of contamination, and site risks. A summary of the sampling and analytical program, boring and test pit information, and details ~~on~~ of the environmental investigations and actions conducted ~~at OU2~~ are included in OU2 Supplemental RI Report (TtNUS, ~~September 2008~~March 2010). A summary of the OU2 Supplemental RI Report, including nature and extent of contamination, is presented in Section 1.6.

1.6 OU2 SUPPLEMENTAL RI REPORT SUMMARY

In ~~2008~~2010, the Navy prepared the OU2 Supplemental RI Report to assess the nature and extent of contamination and risks associated with the contamination at Sites 6 and 29. The primary and secondary soil chemicals of concern (COCs) are lead, PCBs, copper, nickel, and polycyclic aromatic hydrocarbon (PAHs), respectively. ~~The OU2 Supplemental RI Report concluded that COC concentrations in soil indicate unacceptable risks if the soil is exposed or excavated. Evaluation of the nature and extent of lead contamination indicates areas clearly impacted by site-related releases. However, southwest of Quarters N, there is uncertainty as to whether lead concentrations represent OU2 contamination or contamination from residential uses (including use of lead-based paint). The Supplemental RI concluded that exposure to groundwater and migration of groundwater off site do not pose unacceptable risks, and therefore groundwater is not a medium of concern. Due to the placement of shoreline erosion controls, further evaluation of sediment contamination at MS-11 is not required.~~ The following provides a summary of site characteristics, nature and extent of contamination, fate and transport of contamination, ~~and~~ results of the risk assessment, and conclusions and recommendations as provided in the OU2 Supplemental RI Report (TtNUS ~~September 2008~~March 2010).

1.6.1 Site Characteristics

Site characterization information including regional and site-specific information on demography, land use, surface features, climatology, surface water, hydrology, ecology, geology, ~~and~~ hydrogeology, and evaluation of the shoreline revetment is provided in Section 2.0 of the OU2 Supplemental RI Report.

Information on site characteristics was used in the RI to support the evaluation of the nature and extent of contamination, development of the conceptual site model, and understanding of potential site risks. The following provides a brief summary of pertinent information reported in the OU2 Supplemental RI Report.

1.6.1.1 Demography and Land Use

PNS has approximately 90 officers and enlisted personnel and about 3,900 civilian employees (PNS, June 2007). Kittery, Maine, is a residential community of 9,500 people, and Portsmouth, New Hampshire, has a population of approximately 21,000 (based on the 2000 Census). Area industries include retail and wholesale trades, textiles, manufacturing, fishing, shipbuilding, power plants, and gas storage facilities. The countryside north and west of Kittery consists of forests and some farmland. Along the coast south of Portsmouth are small communities and seasonal dwellings.

A portion of PNS is on the National Register of Historic Places. The Portsmouth Naval Prison Historical District is the nearest historical district, located approximately 500 feet east of OU2. Prehistoric and historic archaeological resource sensitivities for the DRMO Impact Area (particularly near Quarters S and N) are moderate and high, respectively. The rest of OU2 has low or moderate sensitivity for prehistoric and historic archaeological resources (Louis Berger Group, Inc., April 2003).

OU2 includes the DRMO Storage Yard (Site 6), Site 29, and DRMO impact area (Figure 1-2). DRMO Storage Yard-related activities continue to be conducted, and access to the area is controlled. DRMO Storage Yard activities include storage of various types of equipment such as empty unused dumpsters, temporary buildings, and other types of metal structures. Vehicles are used to transport the equipment and scrap metal from the DRMO Storage Yard to other areas of the facility or off of the facility. There are no recreational facilities at Sites 6 and 29, although a portion of OU2 east of the DRMO Storage Yard is covered with grass and could be accessed by anyone at the Shipyard. The DRMO impact area, which includes Quarters S, N, and 68, is a residential area used by military personnel for generally 3- to 4-year tours of duty. The area has been a residential area since the 1800s. All of these areas along with the offshore area make up the DRMO Storage Yard.

1.6.1.2 Physical Characteristics

OU2 elevations are highest in the DRMO Impact Area (northern portion of OU2) and decrease toward the PNS southern coastline. The elevation change across OU2 is approximately 15 to 30 feet (elevations of 125 to 140 feet decreasing to 110 feet). The majority of OU2 (DRMO Storage Yard, Building 298 area, and waste disposal area) is relatively flat, with average elevations around 110 feet. There is a sharp incline to the east of the waste disposal area where bedrock is exposed. The top of the incline is at an elevation of 140 to 150 feet.

The DRMO Impact Area is a residential area (including Quarters S, N, and 68) and is covered with grass, houses, and roads. The DRMO Storage Yard is covered with asphalt and an interim cap. A jersey barrier runs along the eastern and northeastern portion of the interim capped area, and the DRMO Storage Yard fence runs along the remainder of the interim capped area to prevent access to the area. The cap was placed in 1993 as an interim measure and is approximately 2 feet thick. The interim cap components include 1 foot of compacted crushed stone aggregate stabilized with Portland cement over 16-ounce, non-woven, needle-punched geotextile above and below a geocomposite clay liner (GCL) (McLaren/Hart, April 1993). There is a grass cover over the interim cap. Access to the area is arranged through the DRMO office. The Building 298 area and waste disposal area ~~is~~ are covered with grass (south, east, and north of Building 310), concrete or asphalt and includes Buildings 298 and 310. As part of the removal action in 2006~~G~~ gravel (ballast rock) over 8-ounce non-woven geotextile was placed over the soil in the wooded area in the waste disposal area after surficial debris was removed from this area ~~as part of a removal action in 2006~~ (TtEC, June 2008).

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

Climatology information was obtained from the NOAA internet site for the National Climatic Data Center Office for the Portland, Maine, weather station, which is the NOAA coastal weather station closest to PNS. The climatological data for Portland, Maine, are based on mean observations from 1975 to 2006 (NOAA, January 2007). Precipitation (including liquid water equivalent for snowfall) is fairly evenly distributed over the year, with approximately 3 to 5 inches falling per month, for an annual total of approximately 46 inches for Portland. Monthly average temperatures for Portland range from approximately 20 to 40 °F from November through April and from approximately 50 to 70 °F from May to October. Snowfall occurs mostly from November to April, with little snow occurring in October and May. The annual snowfall is approximately 24 inches. Portsmouth climate tends to be similar to Portland; however, because of its location near the ocean, there tends to be a little less snow and more rainfall in Portsmouth than Portland.

1.6.1.3 Surface Water and Hydrology

Surface water drainage at OU2 is collected by storm drains that discharge to storm water outfalls along the shoreline. Surface water runoff that is not collected by the storm drains discharges directly to the Piscataqua River. Because OU2 is well developed, there is minimal water infiltration to groundwater. The DRMO Storage Yard is used year-round, so snow removal is necessary to keep the DRMO Storage

Yard clear. Snow was historically plowed over the shoreline into the Piscataqua River or into piles near the entrance to the DRMO Storage Yard (PNS, January 1997). Currently, snow is plowed into piles within the DRMO Storage Yard; snow plowing over the shoreline into the river is no longer conducted.

Based on a flood zone map for the PNS area, the 100-year flood zone in the vicinity of OU2 is at an elevation of 105 feet, and the 100-year coastal flood zone based on wave action is at an elevation of 109 feet (FEMA, July 1986). The OU2 shoreline is within these two zones. As indicated in Section 1.6.1.2, OU2 is at an elevation of 110 feet to 140 feet. Therefore, with the exception of the OU2 shoreline, OU2 is not located within the 100-year flood zone, and wave action would not result in flooding of the site. As noted by the Maine Geological Survey, the general trend of sea level increase is at a rate of 0.09 inches per year (Kelly, Dickson, and Belknap, 2005). An accepted prediction of sea level rise is +1.6 feet by 2100.

Semi-diurnal tidal currents, the horizontal motions associated with tidal changes in water levels, predominate in Portsmouth Harbor. Near Seavey Island, the mean tidal range is 8.1 feet. The overall ebb and flood currents in the vicinity of PNS are high. The average flood currents range from 3.0 knots south of Seavey Island to 3.3 knots southwest of Badgers Island (located approximately 1,000 feet east of PNS). The average ebb currents are 3.8 knots south of Seavey Island and 3.7 knots southwest of Badgers Island. Because of the strong currents, most ships wait for favorable tides before moving up and down the narrow Piscataqua River. The estimated flushing rates of Portsmouth Harbor and the lower reaches of the Great Bay Estuary range from 3.3 to 6.3 tidal cycles (McLaren/Hart, March 1994).

1.6.1.4 Ecology

OU2 is mostly paved, covered with buildings, or covered with residential lawns (in DRMO Impact Area). There is a grassy area north and east of Building 310 and trees along the edge ~~of~~ and on the bedrock outcrop east of the grassy area. OU2 provides limited habitat for ecological receptors. No known endangered, threatened, or protected species or critical habitats are located within the boundaries of PNS, including OU2. PNS is not included in the critical habitats of any species (Maine Fisheries and Wildlife, January 1989; NFEC, August 1993). The short-nosed sturgeon is a federally endangered species that is found along the eastern seaboard, but has no critical habitats located within the State of Maine. Populations in Maine are found in the Sheepscot, Kennebec, Androscoggin, and Penobscot Rivers, and Merrymeeting Bay (Maine Department of Inland Fisheries and Wildlife, 2003).

The shoreline of OU2 is steep (1.5-foot horizontal to 1-foot vertical slopes) and rocky. The entire length of the OU2 shoreline is currently protected with one of three types of shoreline protection (seawall, riprap revetment, and pre-cast concrete block revetment). Unlike other shorelines associated with PNS, the OU2 shoreline does not contain wetlands or mud flats.

The OU2 offshore area includes the pelagic habitat, which consists of the open water of the Piscataqua River. The bottom of the pelagic area (channel bottom/sub-tidal habitat) includes hard-bottom areas and fine-grained depositional areas. The hard-bottom areas are located where there is tidal scouring and active erosion. Fine-grained depositional areas are not present offshore of OU2. The rocky intertidal habitat occurs in many locations along Seavey and Jamaica Islands where the shoreline is exposed to river currents and where there are no appreciable fine-grained sediment accumulations (such as the OU2 offshore area). Only a small intertidal area is present to the east of OU2, but little sediment is present in this area.

1.6.1.5 Geology

The current coastline and topography of OU2 were created by using fill material. Fill material is encountered from the ground surface to a maximum depth of approximately ~~42~~ 35 feet bgs (DSB-8B). In general, fill thickness increases from north to south (away from the 1901 historical shoreline). By volume, most of the fill material consists of ~~large~~ angular rock fragments, which are composed of dark gray, fine-grained quartzite, referred to as "rock fragment fill." The rock fragment fill may include trace to some (less than 45 percent) sand, or trace amounts of debris (metal wire). The remainder of the fill material ("surface fill") consists of sand and gravel, cinders, and other ~~general~~ minor debris (such as scrap metal, wood debris, glass, plastic, wire, and sandblasting grit, depending on the location at the site).

Bedrock at OU2 consists of a dark gray or greenish-gray quartzite. The bedrock surface was determined to generally slope to the east and south towards the river. Bedrock depths varied from 1.5 to 42 feet. It can be difficult to distinguish between weathered bedrock and larger fill material because both are composed of the same quartzite. For the western portion of OU2, the depth to bedrock increases from the island interior toward the coastline, and from west to east. The relatively flat topography results in an increasing thickness of overburden material toward the current coastline (from north to south) and toward the east. For the eastern portion of OU2, depth to bedrock increases from the island interior toward the current coastline (from north to south) and from west to east, similar to the western portion.

In the waste disposal area, industrial waste materials ~~(metal, ash, wood, wire, glass)~~ were found generally overlying the bedrock (in the area filled after 1901) and overlying rock fragment and surface fill in the area filled before 1901. The waste disposal area extends to the bedrock outcrop to the east. Waste refers to material composed mostly of ash, wire, metals, wood, cinders, rubber, and glass along with some soil fill (sand with rock fragments, silt, and/or clay). The waste materials were principally found in the waste disposal area. Fill material with minor occurrences of metal pieces, wood pieces, and cinders, is referred to as debris, and were encountered in areas of OU2 outside of the waste disposal area. The waste and debris materials are differentiated based on the timing of placement, the proportions of materials, and the likely

sources of the material and/or deposition based on site history. OU2 is composed mainly of fill material that was placed during two time periods: the early 1900s during the removal of Henderson's point and from the 1920s to the 1970s, when a portion of the site was filled with waste. Based on the timing of the filling and the source of the fill material, the fill material from the removal of Henderson's point containing debris is not considered a potential source of contamination. However, the fill material placed post-1920s in the waste disposal area was from the disposal of trash and ashes from trash burning operations and is considered a potential source of contamination. ~~East of the waste disposal area, some debris and pockets of soil were found on the bedrock outcrop.~~

The remainder of the area filled after 1901 consists of surface fill overlying rock fragment fill that overlies bedrock. Surface fill ranges from 2 to 8 feet thick, and rock fragment fill ranges from 5 to 30 feet thick. Surface fill material includes scrap metal and other metal debris in the interim capped area. Copper slag was found in one area (TP-201) in the top 2 to 3 feet bgs of soil.

The dumpster storage area was part of the original island (defined by the 1901 historic shoreline), and the subsurface is bedrock overlain by surface fill material, some of which has trace clay. ~~The~~ Originally surface fill was likely added to this area to fill in a low spot and match the grade in the DRMO Storage Yard to the east. Surface fill observed in borings installed post 1991 may represent the fill material placed in 1991 as part of a Shipyard soil removal.

The DRMO Impact Area was part of the original island and appears to be native (Lyman) soil and/or topsoil fill at the surface overlying bedrock. A triangular area in the DRMO Impact Area is an exception because it does not appear to have been a part of the original island and has the same surface and subsurface characteristics as the DRMO Storage Yard. The triangular area in the DRMO Impact Area was filled after 1901.

1.6.1.6 Hydrogeology

A detailed description of the hydrogeology of PNS is provided in the RFI Data Gap Report (Halliburton NUS, November 1995), which also provides detailed figures showing groundwater elevations at the facility at high tide and low tide and salinity data. Several other reports have detailed information pertaining to the hydrogeology at PNS including the RFI (McLaren/Hart, July 1992) and Groundwater Monitoring Summary Report (TtNUS, August 1999) and Field Investigation Report at Site 29 (TtNUS, March 2000). These reports include estimates of hydraulic conductivities, groundwater elevations during several sampling events, and summaries of other hydrogeological data collected (e.g., tidal data, groundwater quality during sampling, etc.). Groundwater data were also collected in 2007 and 2008 as part of the OU2 Additional Investigation. The following describes hydrogeological conditions of PNS and OU2:

Groundwater is encountered within both unconsolidated materials and bedrock at the facility. In general, overburden materials are moderately to highly permeable. Bedrock permeability is generally less than that of unconsolidated materials. Groundwater in bedrock occurs principally in fractures that intersect and enable groundwater to potentially travel in various directions. Near the bedrock surface, fractures are pervasive because of weathering of the rock. The size and interconnectedness of the fractures generally decrease with depth, potentially limiting the movement of groundwater.

Groundwater levels in overburden at PNS are shallow, and groundwater flow directions generally mimic topography and are influenced by the thickness and composition of the overburden and tidal fluctuation. Overall, groundwater flow directions are from the original island interior toward the current coastline.

A total of 22 groundwater monitoring wells have been installed at OU2 (as shown on Figure 1-4), of which 15 are located west of the interim capped area (DW-1, DW-1B, DW-2, DW-2B, DW-4, DW-5, DW-6, DW-7, DW-7B, DW-7DB, DW-7S, DW-12I, DW-12S, DW13I, and DW-13S), six are located east of the interim capped area (DW-3, DW-3S, DW-8, DW-8B, DW-9, DW-10B), and one is located upgradient of the western side of OU2 (DW-11). Although monitoring well DW-2, located west of the interim capped area, was abandoned in the mid-1990s, previous tidal information for this well is discussed herein. Table 2-1 lists well construction details for the existing wells at OU2. OU2 monitoring wells range in total depth from 9 to 150 feet bgs and are screened in fill only, fill and weathered bedrock, fill and bedrock, and bedrock only. Screen lengths included 5 feet, 10 feet, and 20 feet and were selected based on the lithologies encountered and anticipated tidal fluctuations. Specific details concerning construction of the groundwater monitoring wells and hydraulic conductivity testing are provided in the OU2 Supplemental RI Report (TtNUS, ~~September 2008~~March 2010).

Hydraulic gradients are steeper in the OU2 area during low tide, with differences in water level elevations ranging from 98 feet in the northern portion of OU2 to 91 feet along the coastline in areas where fill is present (Figures 2-11 and 2-12 of the OU2 Supplemental RI Report). At the western and eastern edges of OU2, near the historical shoreline where bedrock is closer to the surface (i.e., near DW-6 and to a lesser extent east of DW-8 and DW-9), groundwater elevations are higher than in adjacent areas where the subsurface is primarily composed of porous fill material. In contrast, the groundwater gradient is flat across the entire area during high tide, exhibiting a difference of less than 1 foot in OU2 (Figure 1-4).

For more information on the OU2 hydrogeology, refer to the OU2 Supplemental RI Report (TtNUS, March 2010).

1.6.2 Nature and Extent of Contamination

As discussed in Section 3.0 of the OU2 Supplemental RI Report, the primary contaminant sources ~~associated at OU2~~ are associated with storage of material and equipment at the DRMO Storage Yard and disposal of waste materials in the waste disposal area. Potential secondary release mechanisms in the DRMO include past snow plowing and loading and offloading of materials for storage in the DRMO Storage Yard. The primary and secondary soil contaminants identified in the OU2 Additional ~~Scrutiny~~ Investigation QAPP (TtNUS, October 2007) are lead and PCBs and copper, nickel and PAHs, respectively. Lead was detected across the largest areas and ~~therefore~~ defines the maximum extent of soil contamination at OU2. Relatively ~~H~~high lead concentrations (greater than 15,000 mg/kg) were found in areas clearly associated with OU2 sources found within the DRMO Storage Yard, north of the DRMO Storage Yard fence line (in the backyard of Quarter N), in the interim capped area within the DRMO Storage Yard fence, and in the waste disposal area. Most ~~elevated~~ lead concentrations (greater than 1,000 mg/kg) were found near OU2 source areas, within the DRMO Storage Yard fenced area, along the shoreline of OU2, in the waste disposal area, or in the Building 298 area. North of the DRMO Storage Yard, the elevated concentrations are generally within 20 feet of the DRMO Storage Yard fence. ~~However, lead concentrations greater than the residential risk screening level (400 mg/kg) were found in several locations not associated with OU2 source areas, which suggests that other sources of lead (e.g., use of lead-based paint on buildings) contributed to the elevated concentrations. The extent of lead contamination from OU2 in the waste disposal area, around Building 298, in the DRMO Storage Yard fenced area, and in the area west of the DRMO Storage Yard are well defined. North of the DRMO Storage Yard, within the Quarters S and N backyards, the extent of high lead concentrations is well defined. Due to the potential impact from the long history of residential use in this area, there is some uncertainty as to the extent of impacted soil from DRMO Storage Yard operations to the south and southwest of Quarter N.~~

Based on the soil data, the extent of lead contamination from OU2 in the waste disposal area, around Building 298, and within the DRMO Storage Yard fence line are well defined. North of the DRMO Storage Yard, within the Quarters S and N backyards, the extent of high lead concentrations is also well defined.

Relatively low concentrations of lead and other chemicals were found in the area used for dumpster storage. However, it is not known whether the low level of contamination is because the area was not impacted by DRMO activities or because impacted soil was removed in 1991. Past plowing of snow from the DRMO entrance to the west may have pushed soil contamination from the DRMO to the area to the west of the entrance. In the past, contaminants may have leaked from materials stored at the DRMO that were loaded or offloaded in the area west of the DRMO entrance. Therefore, past snow plowing or loading and offloading of materials for storage in the DRMO in the western area may have contributed to the contamination in this area. Based on this information and in consideration of the lead and/or PCB

concentrations in several samples collected to the west of the dumpster storage area (SS-02, SS-01, and SS-01-03), there is some uncertainty in the extent of OU2 contamination in the area adjacent to the west of the DRMO. Therefore, the extent of OU2 contamination may not be defined in the area west of the DRMO.

An area of high lead concentrations was found north of the DRMO Storage Yard fence line (in the backyards of Quarters S and N), suggesting that DRMO activities occurred in this area or that materials stored at the DRMO Storage Yard were pushed into the area during snow plowing. The elevated lead concentrations are generally within 20 feet of the DRMO Storage Yard fence. Scrap metal was found north of the capped area (where scrap metal storage was conducted before 1993), north of the DRMO Storage Yard fence. Soil where scrap metal was found had elevated lead and copper concentrations. The general extent of lead contaminated soil in the backyards of Quarters S and N (within the DRMO Impact Area) has been defined; however, there is some uncertainty in the extent of contamination north of the dumpster storage area/south of OU2-PA01 and in the backyard of Quarters S. Because of likely impact to soil from the long residential use of the area, there is also some uncertainty to the extent of impacted soil from DRMO Storage Yard operations to the south and southwest of Quarters N. Physical site features limit the extent of impacts from OU2 in the east of Quarters N backyard (bedrock outcrop and concrete wall northwest of Building 172 and steep hill north/northeast of Building 172).

Outside of the waste disposal area, contaminant concentrations generally decreased with depth, and less soil material was found below approximately 6 feet bgs across the site. Soil material was found generally to 10 feet bgs in the capped area. The majority of the contaminated soil was found in surface fill, within the upper portion of the unsaturated zone. Some soil contamination was found extending deeper and into the rock fragment fill, which was generally found at or below mean high tide elevation. Based on the sampling protocol developed in the OU2 Additional Investigation QAPP, most of the 2007 borings were installed to a maximum depth of 6 to 8 feet bgs (to the approximate bottom of the surface fill/top of the rock fragment fill), consistent with the depth for potential human health exposure. Soil data for the rock fragment fill is not as extensive as the surface fill, and available data shows some soil contamination in the rock fragment fill.

PCB and copper concentrations provide additional information for understanding hot spot areas of soil contamination at OU2. High copper concentrations (greater than 6,000 mg/kg) were found in the area asphalted in 1993, near the shoreline south of the interim capped area, north of the DRMO Storage Yard fence line (southeast of Quarter N), and in the waste disposal area. An area of high PCB concentrations (greater than 10 mg/kg) was also found in the interim capped area and waste disposal area and in portions of the current DRMO Storage Yard. The maximum extent of nickel and PAH contamination are within the areas defined by lead, copper, and PCB contamination.

For groundwater, copper, lead, and nickel were identified as primary contaminants in the Additional Investigation QAPP because these are the offshore COCs. The 2007 groundwater data show that overall the concentrations of copper, lead, and nickel are low (less than groundwater screening levels). Most detections occurred in unfiltered samples, and ~~dissolved~~ concentrations in the filtered samples were generally lower. With the exception of elevated concentrations in unfiltered samples from three wells, concentrations of copper, lead, and nickel were generally similar across OU2 and during all tidal stages. The ~~dissolved~~ filtered samples for the three wells did not have elevated concentrations compared with the other filtered samples; therefore, the elevated levels in the unfiltered samples were~~are~~ from soil particulates in the groundwater.

The nature and extent of contamination in the offshore area was evaluated through surface water data from 2007 and sediment data collected at MS-11 as part of the Interim Offshore Monitoring Program. Except for one sample, concentrations of copper, lead, and nickel in surface water samples were less than detectable levels. Copper was detected at SW-6 at a concentration of 8 µg/L in the unfiltered sample, but was not detected in the filtered sample. ~~For sediment, elevated copper, lead, and nickel concentrations were detected in the small intertidal area east of OU2 (at MS-11, Location 3). These concentrations were the result of eroding soil along the OU2 shoreline. In 2005 and 2006, shoreline erosion controls were put in place, and it was determined that further evaluation of sediment contamination at MS-11 was not required.~~ Sediment data were evaluated as part of the Interim Offshore Monitoring Program and Additional Scrutiny Investigation. It was concluded based on the evaluation as presented in the Additional Scrutiny Report (TtNUS, August 2007) that elevated copper, lead, and nickel concentrations in sediment in the offshore area (at MS-11, Location 3) were likely the result of eroding contaminated soil along the OU2 shoreline. Shoreline controls were placed over the eroding soil in 2005 and 2006. The area of impacted sediment is very small, and it was concluded as part of the Additional Scrutiny Investigation (TtNUS, August 2007) that further evaluation of sediment contamination was not required. Consistent with the Additional Scrutiny Report conclusions and the OU2 Additional Investigation QAPP, sediment data for MS-11, Location 3 has not been collected after the shoreline controls were placed.

1.6.3 Fate and Transport of Contaminants

As discussed in Section 4.0 of the OU2 Supplemental RI Report, groundwater, surface water, sediment, and soil data collected for OU2 and the OU2 offshore area support the modeling conclusions that surface water would not be significantly impacted by onshore sources of contamination under current conditions.

~~As indicated by~~The conclusions of the modeling and erosion of metal debris and soil observed along the shoreline adjacent to MS-11~~,~~ Location 3, indicated that~~,~~ elevated chemical concentrations in sediment

likely resulted from erosion of contaminated soil in the eastern portion of OU2 rather than from discharge of contaminated groundwater from OU2 to surface water and then deposition in sediment in the offshore intertidal zone. Erosion controls (shoreline revetment and seawall) are in place along the entire OU2 shoreline.

~~Erosion is not a current concern because erosion control measures are in place along the OU2 shoreline. The data and modeling support the conclusion that migration of contamination through groundwater or tidal flux water to the offshore is not a significant current or future pathway. With the exception of the waste disposal area, most of the greater levels of contamination occur in soil above the high tide level. Waste materials in the waste disposal areas are present in the tidally saturated and saturated zones; the waste materials are saturated throughout most or all of the tidal cycle. The capped area is the one area outside the waste disposal area where groundwater comes in contact with contaminated soil at high tide. There is no significant difference in high- and low-tide concentrations in filtered or unfiltered on either side of the capped area. Therefore, based on the evaluation of groundwater and surface water data, the migration of groundwater contamination is not a significant migration pathway under current site conditions.~~

Except for the waste disposal area and possibly the interim capped area, most of the contamination at OU2 is in the soil above the high tide level. In the waste disposal area, waste materials are in the tidally saturated and saturated zones and are in contact with water throughout most or all of the tidal cycle. The one area of OU2 outside the waste disposal area where groundwater is in contact with contaminated soil at high tide is the interim capped area. Groundwater concentrations in monitoring wells at the shoreline on either side of the interim capped area (DW-12 and DW-3 clusters) show no significant difference (i.e., no exceedances of screening criteria in total or dissolved metals) between high and low tide results. Based on evaluation of groundwater and surface water data, migration of groundwater contamination (dissolved or particulate) is not considered a significant migration pathway under current site conditions; the groundwater data collected during the OU2 Additional Investigation and the modeling results both support the conclusion that migration of contamination through groundwater or tidal flux water to the offshore is not causing an adverse impact to the offshore and is not considered a significant current pathway for human health and the environment. This is not unexpected because, based on the twice-daily tidal flushing over 50 years or more since contamination was released at OU2, most of the mobile portion of contamination likely has been washed out; therefore, particulate migration and dissolution of contaminations are not likely significant contaminant migration pathways under current conditions. The conclusion that tidal flux transport mechanism is not causing and would not likely cause an adverse risk to the offshore is further supported by the presence of the majority of soil contamination in the unsaturated zone and overall low concentrations of chemicals in groundwater and surface water -in relation to risk screening levels.

Groundwater from OU2 discharges to surface water, and surface water concentrations offshore of OU2 do not show exceedances of surface water criteria that would indicate an unacceptable risk to the environment. Surface water concentrations are considered low enough (i.e., similar to or less than the surface water criteria) that contaminant migration in surface water would not adversely impact sediment concentrations. In addition, because there is little sediment accumulation in the OU2 offshore area, particulates entrained in groundwater discharging from the site would not likely accumulate sufficiently in the offshore area to create a significant habitat for sediment invertebrates. Therefore, it is concluded that unacceptable risks from contaminant migration in groundwater to the offshore are not currently occurring.

However, based on the data limitations and in consideration of future potential conditions, there is uncertainty for future contaminant migration from soil in the capped area to groundwater and subsequent offshore migration and moderate uncertainty for the long-term stability and functioning of the shoreline controls. The following discusses the uncertainties and potential impacts to the risk conclusions.

Data evaluation shows that the overall migration of contaminants in OU2 groundwater under current site conditions does not result in unacceptable risks to the offshore and would not likely result in future unacceptable risks based on the age of the contaminant release, the high dilution of the river, and fast current limiting sediment accumulation. However, there is uncertainty in this conclusion for future contaminant migration from the capped area if the impermeable cap is removed and highly contaminated soil in this area (i.e., lead found at concentrations greater than 100,000 mg/kg) remains in place. Therefore, there could be a potential future risk for migration of highly contaminated soil from this area.

Shoreline controls were placed in 1999, 2005, and 2006, and the portion placed in 2005 was upgraded in 2008. There is moderate uncertainty for the long-term stability of the shoreline revetment because design information is not available to evaluate the potential for future slope-failure from storms and for long-term particulate migration through the revetment. Although the shoreline controls placed in 2005 (offshore of Building 298 area) needed to be upgraded because of signs of potential failure, the shoreline revetment along the DRMO Storage Yard shoreline has been in place since 1999 and no major failures have been identified. Although confirmation sediment sampling has not been conducted in the intertidal area adjacent to the area where controls were placed in 2006, no concerns for erosion were identified during recent observations of the shoreline as part of the OU2 Additional Investigation. Based on the concerns for impact to the offshore from erosion and the uncertainty for the long-term stability of the shoreline controls, there is potential future risk to the offshore from erosion should the controls fail and soil erosion cause deposition in the offshore area adjacent to OU2.

1.6.4 Risk Assessment Summary

As discussed in Section 5.0 of the Supplemental RI, the 2000 human health risk assessment results for OU2 were updated based on data collected in 2007 and 2008. The human health risk assessment evaluated potential risks under current land use conditions and potential future land use conditions (including residential) for three exposure areas, Site 6, Site 29, and the DRMO Impact Area. For the Site 6, the only current exposure would be for a construction worker exposed to surface and subsurface soils during construction activities. Risks to occupational workers exposed to surface soil would be of concern if the asphalt or interim cap is removed. For the remainder of OU2, excluding the DRMO Impact Area, occupational exposure to surface soil and construction worker exposure to surface and subsurface soils are the major current potential exposure concerns. Future residential use of the Sites 6 and 29 areas could only occur under a potential future site development scenario. The DRMO Impact Area includes three military residences and a parking area; therefore, current uses are residential and occupational.

Risks for one or more receptors within Sites 6 and 29 areas exceeded USEPA target risks and Maine guidelines. Exposure to lead would also result in unacceptable risk at both sites. For Site 6, antimony, copper, lead, PAHs, and PCBs were identified as COCs. For Site 29, antimony, lead, PAHs, dioxins/furans, and PCBs were identified as COCs. Lead and copper in soil are greater than the acceptable residential risk levels in a portion of the DRMO Impact Area. For the OU2 FS, PRGs will be developed for these COCs to support delineation of remediation areas for evaluation of remedial alternatives. Uncertainties in the extent of contamination will be considered as part of the delineation of remediation areas and in the evaluation of remedial alternatives.

No onshore ecological risks were attributed to OU2 because most of the site is covered, and there is little habitat in the contaminated areas for exposure to ecological receptors. Human health risks for OU2 receptors are not a concern in the offshore area because people cannot easily access the offshore area from OU2. Lead, copper, and nickel are the ecological COCs for the offshore area; however, offshore sediment does not pose an unacceptable risk~~, and no further action is warranted for sediment~~ because there was very little sediment in MS-11 and there is no longer erosion of contaminated soil from the OU2 shoreline to MS-11. Surface water concentrations are also less than surface water criteria and do not pose unacceptable risk.

1.6.5 Conclusions and Recommendations

The OU2 Supplemental RI Report concluded that the nature and extent of contamination and site risks for exposure to~~in~~ soil and groundwater at OU2 have~~s~~ been sufficiently defined to support ~~the~~ an FS for OU2 to evaluate remedial options for contamination. ~~Based on the distribution of lead concentrations relative to site releases, approximate areas of overall site-related impacts were identified. Soil outside these~~

~~areas has lead concentrations that represent non-site-impacted conditions.~~ Lead and other COC concentrations in soil at OU2 indicate unacceptable risks if the soil is exposed or excavated. Uncertainties in the extent of contamination were identified for the area west of the DRMO and in the backyards of Quarters S and N within the DRMO Impact Area. The Navy will conduct a non-time critical removal action for contaminated soil in the backyards of Quarters S and N. As part of the removal action, additional soil sampling will be conducted. An Engineering Evaluation/Cost Analysis (EE/CA), Action Memorandum, Removal Action Work Plan, and Removal Action Report will be prepared to support the removal action for the DRMO Impact Area.

~~Exposure to groundwater and migration of groundwater off site do not pose unacceptable risks for OU2.Based on the risk evaluation (human health and migration) of the OU2 Supplemental RI, groundwater is not a medium of concern for OU2. The FS Report for OU2 was prepared to address unacceptable human health risks posed by exposure to soil.~~

~~Evaluation of the nature and extent of lead contamination indicates areas clearly impacted by site-related releases. However, southwest of Quarter N, especially within 10 to 20 feet of the house, there is uncertainty as to whether lead concentrations represent OU2 contamination or contamination from residential uses (including use of lead-based paint). Further discussion among the Navy, USEPA, and MEDEP will be needed to determine the appropriate regulatory program to address lead contamination near Quarter N.~~

Although the human health risk assessment evaluated risks based on site areas, PRGs should be developed and applied to the appropriate exposure units across the OU2 area to determine the remediation areas in the FS. Industrial and occupational exposure units should ~~consider~~ reflect current and likely future land uses, areas currently used for residences should use the separate military quarters for the residential exposure units, and future hypothetical residential land use should use 1-acre exposure units for areas not currently used as residences. The uncertainty in the extent of contamination west of the DRMO Storage Yard should be evaluated as part of the development of remediation areas and remedial action alternatives.

Exposure to groundwater does not pose unacceptable risks for OU2 receptors. Migration of groundwater off site does not pose unacceptable risks to the offshore based on current conditions. However, based on the data limitations and in consideration of future potential conditions, there is uncertainty that future contaminant migration from soil in the capped area to groundwater and subsequent offshore migration could result in unacceptable risks to the offshore. To address the future potential for highly contaminated soil in the capped area (where the higher lead concentrations were greater than 100,000 mg/kg) to migrate to groundwater (if the impermeable cap is removed and highly contaminated soil remains), the

Navy recommended that remedial options to address future potential risks for contaminant migration from the capped area to the offshore be evaluated in the FS for OU2.

There is uncertainty in the long-term stability and functioning of the shoreline controls; therefore, there is a potential future risk to the offshore area from erosion if erosion controls fail in the future. To address concerns for impact to the offshore from erosion and uncertainty in the long-term stability of the shoreline controls placed along the OU2 shoreline, the Navy recommended that remedial options to address future potential risks to the offshore from erosion be evaluated in the FS for OU2. Past releases from OU2 that impacted sediment in the offshore area of OU2 are being addressed as part of OU4; therefore, any remedial action for sediment in the OU2 offshore area (including monitoring) will be evaluated as part of the OU4 FS.

1.7 SUMMARY OF CONCEPTUAL SITE MODEL

The following is a summary of the OU2 conceptual site model based on the OU2 Supplemental RI results:

- Site-related releases to fill material in the DRMO Storage Yard before 1983 resulted from the storage of lead and nickel-cadmium battery cells and plates that were stockpiled on uncovered pallets. During this time, other equipment and materials stored at the DRMO Storage Yard in unpaved areas may have leaked resulting in contaminant releases to soil. COCs associated with these releases are antimony, lead, nickel, PCBs, and PAHs. Lead and PAHs could also be from leaks or spills from stored items, from vehicles used as part of DRMO operations, from railroads formerly used to transport equipment and materials to and from the DRMO Storage Yard, or from loading and offloading activities. Based on the distribution of lead concentrations in soil, the area of site-related impacts was identified. Other COCs at OU2 were found within the extent of lead contamination. Areas adjacent to the current DRMO Storage Yard fenceline show contaminant patterns similar to the DRMO area and include the area adjacent to the waste disposal area, in the dumpster storage area, and in the backyards of Quarters S and N (within the DRMO Impact Area). The extent of contamination may extend west of the dumpster storage area, where loading and offloading activities and snow plowing may have resulted in contaminant releases. Contaminated soil associated with the DRMO generally extends from the surface soils to the top of the rock fragment fill layer, an average of 6 feet bgs. However, some contaminated soil was found at deeper depths.

- The waste disposal area was filled with waste material such as metal debris, steel, garbage, and ash from open burning within the area and from the incinerator located north of the area; filling activities in this area ended before 1980. The waste material was observed from several feet bgs to the top of bedrock or rock fragment fill, which occurs at greater than 10 feet bgs along the

shoreline and as shallow as 5 feet bgs inland. Most of the waste material (particularly along the shoreline) is in the saturated zone. The waste material on the shoreline side is contained by a seawall. COCs associated with the waste material are antimony, copper, lead, nickel, PAHs, and dioxins/furans. The extent of contamination was delineated based on the extent of waste material.

- Except for the DRMO Impact Area, most of OU2 and adjacent areas are paved and currently used for occupational activities (DRMO Storage Yard, dumpster storage area, Buildings 298 and 310, and west of the DRMO Storage Yard). There is a fence around the DRMO Storage Yard, including the portion with an interim cap. The interim cap area has a grass cover and is not used as part of the DRMO activities. The DRMO Impact Area includes military residences (Quarters S, N, and 68). The Shipyard does not have plans to change land use for OU2.

- The depths for human health exposure to soil are based on feet bgs. For the DRMO Storage Yard area (area within the fence), which is paved or capped, the only current exposure would be for a construction worker exposed to surface (0 to 2 feet bgs) and subsurface (2 feet bgs to the upper tidally saturated zone, which is approximately 10 feet bgs) soil during construction activities. Risks to occupational workers exposed to surface soil would be of concern if the asphalt or interim cap is removed. Access to the DRMO Storage Yard is restricted; therefore, recreational exposure is not a current concern for this area. For the remainder of OU2, excluding the DRMO Impact Area, occupational exposure to surface soil and construction worker exposure to surface and subsurface soil are the major current potential exposure concerns. There is current residential use of the DRMO Impact Area and future hypothetical residential use of the rest of OU2. For the human health risk assessment, current and future potential risks were evaluated. The human health risk assessment indicated unacceptable risks for all receptors exposed to soil at OU2 for lead and one or more other COCs. Lead and copper concentrations in soil are greater than the acceptable residential risk levels in a portion of the DRMO Impact Area. Unacceptable risks for residential, construction worker, occupational worker, and recreational user were found throughout the DRMO area and the waste disposal area.

- Groundwater at the site is brackish/saline and is not a potable source of water. Non-potable exposure to groundwater would be for a construction worker exposed to groundwater during excavation below the water table. Based on the risk evaluation for human health groundwater exposure does not pose unacceptable risks.

- Migration of groundwater off site does not pose unacceptable risks to the offshore based on current conditions. However, based on the data limitations and in consideration of future potential

conditions, there is uncertainty that future contaminant migration from soil in the capped area to groundwater and subsequent offshore migration could result in unacceptable risks to the offshore.

- Shoreline erosion controls are in place along the OU2 shoreline; therefore, erosion of contaminated soil is not a current concern for OU2. There is uncertainty in the long-term stability and functioning of the shoreline controls, and therefore, there is a potential future risk to the off shore from erosion. Past releases from OU2 that impacted sediment in the offshore area of OU2 are being addressed as part of OU4; therefore, any remedial action for sediment in the OU2 offshore area (including monitoring) will be evaluated as part of the OU4 FS.

~~OU2 consists of Site 6 – the DRMO Storage Yard, Site 29 – the Teepee Incinerator Site, and the DRMO Impact Area.~~

~~Based on the distribution of lead concentrations in soil, the area of site-related impacts was identified. Other COCs at OU2 were found within the extent of lead contamination.~~

~~Based on the risk evaluation (human health and migration), groundwater is not a medium of concern for OU2. Site conditions and groundwater concentrations support that there is limited solubility of metals from soil to groundwater and that site groundwater migrating to the offshore would not adversely impact surface water and sediment in the Piscataqua River.~~

~~Evaluation of offshore data showed that erosion of contaminated soil along the OU2 shoreline, not migration of contaminated groundwater, was the source of contamination detected in offshore sediments. Therefore, no environmental impacts are expected to occur because of migration of groundwater from OU2 to the offshore. Shoreline erosion controls have been put in place along the OU2 shoreline; therefore, erosion of contaminated soil is not a current concern for OU2.~~

~~The human health risk assessment indicated unacceptable risks for one or more receptors exposed to soil at OU2. Lead and copper concentrations in soil are greater than the acceptable residential risk levels in a portion of the DRMO Impact Area.~~

2.0 REMEDIAL ACTION OBJECTIVES

This section identifies the ARARs, discusses the medium of concern, and develops the RAOs for remedial activities at OU2. ARARs are regulatory requirements and guidance that govern remedial activities. The medium of concern at OU2 is defined along with the volume of the contaminated medium. RAOs are medium-specific goals that define the objectives of conducting remedial actions and are developed to allow consideration of a range of remedial alternatives developed in subsequent sections.

2.1 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS ~~–~~AND TO BE CONSIDERED CRITERIA

Tables 2-1 through 2-3 present a summary of federal and State of Maine ARARs and "to be considered" (TBC) criteria for OU2. The two threshold criteria that remedial alternatives must meet, as described in Section 4, are: (1) protection of human health and the environment and (2) compliance with ARARs. Remedial alternatives must attain or exceed conformance with all ARARs unless a waiver of an ARAR is justified, as described further in this section.

ARARs address a chemical, location, or action at a site and are defined as any standard, requirement, criterion, or limitation under federal environmental law, or any promulgated standard, requirement, criterion, or limitation under a state environmental or facility-siting law that is more stringent than the associated federal standard, requirement, criterion, or limitation, that is either legally applicable to the CERCLA hazardous substance(s) at the site, or is relevant and appropriate under the circumstances of the hazardous substance release.

One of the primary concerns during the development of remedial action alternatives for hazardous waste sites under CERCLA is the degree of human health and environmental protection afforded by a given remedy. Section 121 of CERCLA requires that primary consideration be given to remedial alternatives that attain or exceed ARARs. The purpose of this requirement is to make CERCLA response actions consistent with other pertinent federal and state environmental requirements.

Definitions of the two types of ARARs, as well as TBC criteria, are as follows:

- Applicable Requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site.

- Relevant and Appropriate Requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, although not "applicable," address problems or situations sufficiently similar (relevant) to those encountered at the CERCLA site that their use is well suited (appropriate) to the particular site.

- TBC Criteria are non-promulgated, non-enforceable guidelines or criteria that may be useful for developing remedial action alternatives and for determining action levels that are protective of human health and/or the environment. Examples of TBC criteria include Cancer Slope Factors (CSFs) and Reference Doses (RfDs).

Section 121(d)(4) of CERCLA allows the selection of a remedial alternative that will not attain all ARARs if any of six conditions for a waiver of ARARs exists. These six conditions are as follows: (1) the remedial action is an interim measure whereby the final remedy will attain the ARAR upon completion; (2) compliance will result in greater risk to human health and the environment than other options; (3) compliance is technically impracticable; (4) an alternative remedial action will attain the equivalent of the ARAR; (5) for state requirements, the state has not consistently applied the requirement in similar circumstances; or (6) compliance with the ARAR will not provide a balance between protecting public health, welfare, and the environment at the facility with the availability of fund money for response at other facilities (fund-balancing). The last condition only applies to Superfund-financed actions.

ARARs and TBCs fall into three categories. The characterization of these categories is not conclusive because many requirements are combinations of the three types of ARARs and TBCs. These categories are as follows:

- Chemical-Specific: Health- or risk-based numerical values or methodologies that establish concentration or discharge limits for particular contaminants within the media of concern.

~~limits for particular contaminants within media of concern. Chemical-specific ARARs govern the extent of site cleanup. In the absence of chemical-specific ARARs, site-based cleanup criteria may be developed using guidance provided under USEPA RfD guidance or USEPA Health Assessment Group CSFs.~~

- Location-Specific: Restrictions based on the concentrations of hazardous substances or the conduct of activities in specific locations. These may restrict or preclude certain remedial actions or may apply only to certain portions of a site. Location-specific ARARs and TBCs pertain to special site features, and examples include floodplain and coastal zone requirements.

- Action-Specific: Technology- or activity-based controls or restrictions on activities related to management of hazardous substances. Action-specific ARARs and TBCs pertain to implementing a given remedy. Examples are RCRA requirements for management of hazardous waste that may be generated as part of remedial actions.

~~Throughout the following ARAR analysis and associated tables, the term "potentially" is used when requirements ("applicable" or "relevant and appropriate") would be invoked only if certain remedial actions are taken (may not be "applicable" or "relevant and appropriate" for some of the considered remedial actions).~~

2.1.1 Chemical-Specific ARARs and TBCs

This section presents a summary of federal ~~and State of Maine~~ chemical-specific TBC criteria. Table 2-1 presents a list of federal ~~and State of Maine~~ chemical-specific ARARs and TBCs for OU2. No federal or State of Maine chemical-specific ARARs were identified, and no State of Maine chemical-specific TBCs were identified. The ~~All chemical-specific ARARs and~~ TBCs provide some medium-specific guidance on "acceptable" or "permissible" concentrations of contaminants.

Federal

Office of Solid Waste and Emergency Response (OSWER) Directive 9355.4-12 (Memorandum: Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities) provides a recommended concentration of 400 mg/kg for lead in soil for residential land use. The memorandum clarifies that the recommended concentration is a screening level "that may be used as a tool to determine which sites or portions of sites do not require further study." The memorandum further clarifies that "a screening level is defined as a level of contamination above which there may be enough concern to warrant site-specific study of risks, and "levels of contamination above the screening level would not automatically require a remedial action, nor designate the site as 'contaminated'." The 400 mg/kg screening level was developed based on a model specifically designed to simulate lead uptake in children in a residential setting. Adult lead exposure is evaluated based on a USEPA publication prepared by the Technical Review Workgroup (TRW) for Lead (January 2003), wherein a methodology is described for assessing risks associated with non-residential adult exposures to lead in soil. The directive and the USEPA publication are TBCs for development of PRGs for lead at OU2.

USEPA RfDs are estimates of daily exposure for human populations (including subpopulations) considered unlikely to cause significant adverse effects associated with a threshold mechanism of action in human exposure over a lifetime. RfDs are provided in USEPA's Integrated Risk Information System

(IRIS). RfDs were used to estimate non-carcinogenic risk as part of the Revised OU2 Risk Assessment (TtNUS, November 2000). RfDs ~~can be~~were used to develop PRGs for non-carcinogenic COCs.

USEPA Human Health Assessment Group CSFs present the most up-to-date information on cancer risk potency for known and suspected carcinogens. CSFs are provided in USEPA's IRIS. CSFs were used to estimate carcinogenic risk as part of the Revised OU2 Risk Assessment (TtNUS, November 2000). CSFs ~~can were be~~ used to establish PRGs for carcinogenic COCs.

USEPA Region 9 PRGs are presumptive levels calculated using standard exposure assumptions for residential and industrial land use scenarios. These concentrations are calculated for a hazard index (HI) of 1.0 for non-carcinogens and a risk level of 1×10^{-6} for carcinogens. USEPA Region 9 PRGs were used as screening levels as part of the Revised OU2 Risk Assessment (TtNUS, November 2000). Although not strictly a TBC criterion to be met by remedial action alternatives, the methodology used to calculate the USEPA Region 9 PRGs ~~screening levels~~ can be used to develop ~~PRGs~~soil cleanup levels for chemicals other than lead. USEPA Regional Screening Levels (RSLs) replace the individual USEPA regions screening levels (e.g., Region 9 PRGs) in 2008. ~~The USEPA RSLs are based on Oak Ridge National Laboratory RSLs for Chemical Contaminants at Superfund Sites.~~

Guidelines for Carcinogen Risk Assessment (March 2005) provide a framework to scientists for assessing possible cancer risks from exposures to pollutants or other agents in the environment. The guidelines are intended to make greater use of the increasing scientific understanding of the mechanisms that underlie the carcinogenic process. The guidelines include discussions of all of the four steps of the risk assessment process and provide guidance to risk assessors on these steps. These guidelines are TBCs for OU2 soil and were used to develop PRGs for carcinogenic COCs.

Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (March 2005) addresses a number of issues pertaining to cancer risks associated with early-life exposures in general, and provides specific guidance on potency adjustment only for carcinogens acting through a mutagenic mode of action. If chemical-specific data are not available to directly assess cancer susceptibility from early-life exposures, the guidance recommends a default approach using estimates from chronic studies. These guidelines are TBCs for OU2 and were used to develop PRGs for carcinogenic COCs.

State of Maine

~~Maine Risk Assessment Guidelines are provided in the Guidance Manual for Human Health Risk Assessment at Hazardous Substance Site prepared by MEDEP and the Maine Department of Human Services (June, 1994). The guidance manual provides acceptable carcinogenic and non-carcinogenic~~

~~risk levels at $1x10^{-5}$ and 1, respectively. These guidelines are TBC guidance for making risk management decisions.~~

Remedial Action Guidelines (RAGs) (MEDEP, ~~Division of Remediation, May~~ January 2010 ~~1997~~) present chemical-specific guidelines to assist in making remedial decisions at hazardous substance sites that can be considered for developing soil cleanup levels. ~~Direct contact guidelines are presented for three exposure scenarios: residential, trespasser, and adult worker. The default exposure factors for each scenario are described in the companion Technical Basis and Background for Soil Remedial Action Guidelines Based on Direct Contact (Basis Statement). Both the trespasser and adult worker guidelines are for non-residential exposures. Depending on the contaminant, there may be significant differences, and guidelines protective of one of these populations may not be protective of the others. The residential direct contact standard for lead was established by the Maine Department of Health and Human Services (DHS). MEDEP has consulted with DHS regarding acceptable non-residential guidelines for lead.~~

2.1.2 Location-Specific ARARs and TBCs

This section presents a summary of federal and State of Maine location-specific ARARs and TBCs. Table 2-2 presents a list of federal and State of Maine location-specific ARARs and TBCs for OU2.

Federal

~~Federal Floodplain Management Executive Order (E.O.) 11988 [40 Code of Federal Regulations (CFR) Part 6, Appendix A] provides for consideration of floodplains during remedial actions. E.O. 11988 requires federal agencies to avoid long-term and short-term adverse impacts associated with occupancy and modification of floodplains and to avoid support of floodplain development wherever there is a practicable alternative. If no practicable alternative exists to performing cleanup in a floodplain, potential harm must be mitigated and actions taken to preserve the natural and beneficial values of the floodplain. 40 CFR Part 6, Appendix A contains USEPA policy for implementing the provisions of E.O. 11988. Although a portion of the site is within the 100-year floodplain of the Piscataqua River, it is anticipated that remedial actions for soil at OU2 would not adversely affect the floodplain. However, shoreline stabilization work would extend into the 100-year floodplain of the Piscataqua River.~~

Coastal Zone Management Act [16 United States Code (USC) §1451 *et seq.*] provides for the preservation and protection of coastal zone areas, management of coastal zones to be the state's responsibility, and that management of coastal zone development to be in such a way as to minimize the effects on coastal zone resources. Section 304(1) excludes federal lands from the coastal area if those lands are subject solely to the discretion of or are held in trust by the federal government. Under Section 307 (c), Paragraphs (1) and (2), federal activities and development projects in or directly affecting the

coastal zone must be consistent, to the maximum extent practicable, with a federally approved state management program. This act is applicable if onshore remedial actions at OU2 could impact the coastal zone. However, CERCLA requires that the remedial action meet only substantive requirements of the regulation to provide protection to coastal zone areas. As part of meeting these requirements, MEDEP would be included in the review process for the remedial design and work plan for any alternative affecting the coastal zone at OU2.

~~River and Harbors Act – Section 10 (33 USC 403; 33 CFR 320 to 323) prohibits unauthorized obstruction or alteration of navigable waters. Activities involving excavation or deposition of materials in navigable waters or affecting such waters must serve the public interest, and benefits must outweigh adverse impacts on natural resources, aesthetics, and navigation. These regulations are applicable if remedial actions for OU2 involve work in the Piscataqua River, and such actions would need to be designed to meet the substantive requirements of Section 10 of the act.~~

~~Federal Protection of Wetlands E.O. 11990 provides for consideration of wetlands during remedial actions. This E.O. is implemented by USEPA's August 6, 1985, Policy on Flood Plains and Wetlands Assessments for CERCLA Actions (CERCLA Compliance Policy). E.O. 11990 requires federal agencies, in carrying out their responsibilities, to take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. The order emphasizes the importance of avoiding undertaking new construction located in wetlands (unless there is no practicable alternative to that construction); minimizing the harm to wetlands (if the only practicable alternative requires construction in the wetland); and providing early and adequate opportunities for public review of plans involving new construction in wetlands. A wetlands functions and values assessment would be conducted to guide mitigative efforts for any adverse impacts that may occur to wetlands during remedial activities. Based on the discussion of ecological conditions at OU2, there are no wetlands or mud flats along the OU2 shoreline. Based on the discussion of ecological conditions at OU2, there are no wetlands or mud flats along the OU2 shoreline.~~

Clean Water Act (CWA) - -Section 404(b)-(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR Parts 230-232; 33 CFR Parts §§320-330) regulate the discharge of dredged or fill material into U.S. waters, including wetlands. The purpose of Section 404 is to ensure that proposed discharges are evaluated with respect to impacts on the aquatic ecosystem. Guidelines and regulations related to permitting under the CWA Section 404 program for discharges of dredged or fill material are provided in 40 CFR Parts 230-232. Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR Part 230) are applicable to the dredge and fill of wetland environments. Procedures are established by 40 CFR Part 231 ~~establishes procedures~~ for prohibiting or withdrawing the specification, or denying, restricting, or withdrawing the use for specification of any defined area as a disposal site for

dredged or fill materials pursuant to Section 404(c) of the CWA. Definitions applicable to the CWA Section 404 program are provided by 40 CFR Part 232 ~~provides definitions applicable to the CWA Section 404 program and describes~~ activities that are exempted from permit requirements. If a remedial action involves the discharge of dredge or fill into the waters of the United States, including wetlands, the substantive requirements of this section may need to be met. Discharge of dredged material includes addition of materials incidental to excavation activities. Activities that adversely affect the aquatic ecosystem are prohibited unless there are no practical alternatives. In addition, activities that may affect water quality, violate toxic effluent standards, adversely affect any endangered or threatened species, or cause significant degradation of the waters of the United States (includes significant adverse affects to human health or welfare, aquatic life and other wildlife, and wetlands) are prohibited. This act would be applicable to remedial actions that could potentially include discharge of excavated material or wastewater to the offshore area.

The National Historical Preservation Act (16 USC §470 *et seq.*; ~~,~~ 36 CFR Part 800) establishes requirements relating to potential loss or destruction of significant scientific, historical, or archaeological data as a result of any proposed remedy. Prehistoric and historical archeological resource sensitivity for the DRMO Impact Area (particularly near Quarters S and N) are moderate and high, respectively. The rest of OU2 has low or moderate sensitivity for prehistoric and historic archaeological resources. ~~OU2 is low.~~ The State Historic Preservation Officer (SHPO) would be contacted and the remedial design and work plans would be developed to meet the substantive requirements of this act. This act would be applicable to remedial activities at OU2. ~~This act would be applicable if excavation activities are included as part of a remedial action at OU2.~~

The Endangered Species Act of 1973 (16 USC §1531 *et seq.*; 50 CFR Part 402) provides for consideration of impacts to endangered and threatened species and their critical habitats. As discussed in Section 1.0, there are no known endangered or threatened species at OU2; however, the federally-listed endangered short-nosed sturgeon is known to occur in the Piscataqua River. There are no known critical habitats for the short-nosed sturgeon in the State of Maine. The Act requires federal agencies to ensure that any action carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or adversely affect its critical habitat. Remedial activities would be conducted so as to avoid any adverse effect under the Endangered Species Act to the short-nosed sturgeon.

The Fish and Wildlife Coordination Act (16 USC §661 *et seq.)* provides for consideration of the impacts of remedial actions on bodies of water. The act requires that federal agencies, before issuing a permit or undertaking federal action for the modification of any body of water, consult with the appropriate state agency exercising jurisdiction over wildlife resources to conserve those resources. Coordination with

United States Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS) and appropriate state agencies would be required, if alteration of a body of water, including discharge of pollutants into a wetland or construction in a wetland, will occur as a result of remedial activities. This act would be applicable to remedial actions at OU2 that may impact the coastal floodplain or adjacent river. Activities that would reduce adverse impacts would be considered and implemented, as appropriate, after coordination with USFWS and NMFS.

~~The Fish and Wildlife Coordination Act (16 USC 661 *et seq.*; 33 CFR 320; 40 CFR 6.302) and the Federal Protection of Wetlands E.O. 11990 (40 CFR Part 6, Appendix A) have been evaluated and determined not to be ARARs because there are no wetlands or protected habitats within or adjacent to OU2. The Migratory Bird Treaty Act (16 USC 703) and the Marine Mammal Protection Act (16 USC 1361 through 1421h and 40 CFR 13, 18, 216, and 229) have been evaluated and determined not to be ARARs because human activity and the high density of industrial activity in OU2 precludes the presence of a significant habitat. Therefore, these acts are not considered further in this FS.~~

~~The Endangered Species Act of 1973 (16 USC Chapter 35) provides for consideration of impacts to endangered and threatened species and their critical habitats. This act requires Federal agencies, in consultation with the Secretary of the Interior, to ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or adversely affect critical habitat. If the secretary determines that such a species may be present, the Federal agency must conduct a biological assessment to identify any endangered or threatened species likely to be affected by the agency's action. However, no known endangered, threatened, or protected species or critical habitat is located within the boundaries of PNS, including OU2, and PNS is not included in the critical habitats of any species (Maine Fisheries and Wildlife, January 1989; NFEC, August 1993). The Soil and Water Conservation Land Management Plan (Soil Conservation Service, August 1985) notes that Northern Bald Eagles are known to use the Great Bay Estuary. Also, this plan indicates that piping plover may possibly exist at the mouth of the Piscataqua River. Regarding other significant habitats, Clark's Island was noted to require special consideration because of its use by colonial nesting seabirds (nesting season is from April 1 to August 15). Clark's Island, located on the eastern side of PNS, is not located near the vicinity of OU2. No endangered or threatened species were identified at PNS during the Onshore Ecological Assessment of PNS (McLaren/Hart, August 1992). Special consideration may be required for remedial action that could disturb nesting seabirds, if present at or nearby OU2. Therefore, the Endangered Species Act is considered a TBC for OU2.~~

State of Maine

Maine Site Location of Development Law [38 Maine Revised Statutes Annotated (MRSA) §481 *et seq.*; 06-096 Code of Maine Rules (CMR) Parts 371-377] regulates the siting of developmental activities to

ensure that developments will have minimal adverse impact on the natural environment and to protect the health, safety, and general welfare of the people. Approval is needed for developmental activity that includes any activity that consumes, generates, or handles hazardous wastes, hazardous matter, or oil. The developmental activity should have no unreasonable adverse effect on the natural environment (e.g., air quality, runoff, erosion and sedimentation, surface water and groundwater quality). Regulations also include consideration of the preservation of historic sites and unusual natural areas and the protection of wildlife and fisheries. This act is applicable ~~at OU2 because~~ if remedial activities at OU2 ~~will~~ affect an area exceeding 3 acres. Substantive requirements of this law would need to be met under the CERCLA process in consultation with MEDEP. Activities would be conducted to reduce the potential for adverse impact on the natural environment, historic sites, and wildlife and fisheries.

Maine Natural Resources Protection Act (38 MRSA §480 *et seq.*; 06-096 CMR Part 305) regulates any activity conducted in, on, or over any protected natural resource or any activity conducted on land adjacent to any freshwater or coastal wetland, great pond, river, stream, or brook that operates in such a way that material or soil may be washed into them. Activities include dredging; bulldozing; removal or displacement of soil or other materials; draining or other dewatering; and construction, repair, or alteration of any permanent structure. The activity must not cause unreasonable erosion of soil or sediment, nor unreasonably inhibit the natural transfer of soil from the terrestrial to the marine or freshwater environment; cause unreasonable harm to any significant wildlife habitat, freshwater wetland, estuarine or marine fisheries, or other aquatic life; or interfere unreasonably with natural water flow. In addition, the activity must not lower water quality or cause or increase flooding in the activity area or adjacent properties.

Disturbance of soil material adjacent to a wetland or water body may be permitted by rule. Standards are to ensure that disturbed soil material is stabilized to prevent erosion of the shoreline and siltation of the water, and standards must be met to qualify for permit by rule. The substantive provisions of this act would be applicable to any remedial action at OU2 that could disturb soil near the shoreline of OU2.

Maine Wetland Protection Rules (06-096 CMR Part 310) provide additional standards for protection of wetlands, as defined in MEDEP Chapter 1000, Guidelines for Municipal Shoreline Zoning Ordinances. ~~protection.~~ Jurisdiction under the Rules includes the area adjacent to wetlands, which is the area within 75 feet of the normal high water line. No activity that would cause a loss in wetland area, functions, and values is permitted if there is a practicable alternative to the project that would be less damaging to the environment. Restoration or enhancement of the affected wetlands may be required (minor alterations that will have no effect on wetland functions and values are exempt).

Maine Coastal Management Policies (38 MRSA §1801 *et seq.*) provide for the regulation, conservation, beneficial use, and management of coastal resource use by federal, state, regional, and local governments. The coastal area incorporates all coastal municipalities and unorganized townships on tidal waters and all coastal islands. The substantive environmental requirements of these standards would be addressed, in consultation with MEDEP.

~~Maine Endangered Species Act (12 MRSA 7751 et seq.) designates species of fish or wildlife found in the State as endangered or threatened. Species listed under the Maine Endangered Species Act include several endangered species (consisting of birds, reptiles, amphibians, mayflies, damselflies and dragonflies, butterflies, and moths) and several threatened species (consisting of birds, mammals, reptiles, amphibians, fish, mollusks, mayflies, damselflies and dragonflies, butterflies, and moths). The rules also identify essential habitats for species designated as endangered or threatened species. Areas requiring special management considerations include the Bald Eagle Nest Site and the Roseate Tern Nesting Area.~~

~~Maine Significant Wildlife Habitat Rules (06-096 CMR 335) outlines requirements for activities impacting significant wildlife habitats, including certain seabird nesting islands. There are no wildlife habitats at OU2; however, special consideration may be required for remedial action that could disturb certain nesting seabirds, if present at or near OU2. Therefore, these rules are considered TBC criteria for OU2.~~

2.1.3 ~~Action-Specific ARARs and TBCs~~

This section presents a summary of federal and State of Maine action-specific ARARs and TBCs. Table 2-3 presents a list of federal and State of Maine action-specific ARARs and TBCs for OU2.

Federal

RCRA Subtitle C, RCRA Regulations for Identification and Listing of Hazardous Water (40 CFR Part 261), Standards Applicable to Generators of Hazardous Waste (40 CFR Part 262) and Standards for Hazardous Waste TSD Facilities (40 CFR Part 264) govern the generation transportation and disposal of hazardous waste. The State of Maine has RCRA delegation, and the Maine Hazardous Waste Management Rules provide references to the federal RCRA regulations where appropriate. These standards are applicable if wastes generated during remedial action is determined to be RCRA characteristic hazardous waste and relevant and appropriate for remedial action that includes a RCRA C cap.

CWA (33 USC~~U.S.C.~~ §1251 *et seq.*); National Recommended Water Quality Criteria (NRWQC) (40 CFR Part 122.44) are used to establish water quality standards for the protection of aquatic life. These

standards would be relevant and appropriate to alternatives that may impact the water quality of the Piscataqua River. Remedial activities would be conducted to reduce adverse impacts to the offshore. Stormwater management, erosion controls, and management of water discharges would be included in remedial activities, as appropriate.

~~Clean Water Act~~CWA - Section 402 National Pollutant Discharge Elimination System (NPDES) (40 CFR Parts 122-125), ~~as amended,~~ governs point-source discharges of pollutants to surface waters through the National Pollutant Discharge Elimination System (NPDES) permit program. NPDES requirements (40 CFR Part 122) may be applicable if the direct discharge of pollutants into navigable waters is part of the remedial action (i.e., discharge of effluent from a treatment system). These regulations contain discharge limitations, monitoring requirements, and best management practices. The substantive requirements of the NPDES permit program would be applicable to any direct discharge to surface waters, including the Piscataqua River, if a treatment system is employed as part of a remedial action at OU2.

~~RCRA Subtitle C regulates the treatment, storage, and disposal of hazardous waste from its generation until its ultimate disposal. According to USEPA guidance (USEPA, August 1988), RCRA Subtitle C requirements for the treatment, storage, or disposal of hazardous waste would be applicable if:~~

- ~~The waste is a listed or characteristic waste under RCRA.~~
- ~~The waste was treated, stored, or disposed (as defined in 40 CFR 260.10) after the effective date of the RCRA requirements under consideration.~~
- ~~The activity at the CERCLA site constitutes current treatment, storage, or disposal as defined by RCRA.~~

~~RCRA Subtitle C requirements would also be applicable if hazardous wastes were generated as a result of remedial activities. Such waste would be required to be managed in accordance with these requirements. As a result, the following RCRA Subtitle C requirements are potentially applicable to OU2:~~

- ~~Identification and Listing of Hazardous Wastes; Toxicity Characteristic (40 CFR 261.24).~~
- ~~RCRA Standards Applicable to Generators of Hazardous Waste (40 CFR 262).~~
- ~~Treatment, storage, and disposal (TSD) facility requirements (40 CFR 264), including corrective action management units (CAMUs) and temporary units.~~
- ~~Land Disposal Restrictions (LDRs) (40 CFR 268).~~

~~RCRA Regulations for Identification and Listing of Hazardous Wastes (40 CFR 261) identify those solid wastes that are subject to regulation as hazardous wastes. Hazardous wastes are listed, and test procedures are outlined to determine characteristic hazardous wastes. Requirements in 40 CFR 261.24 identify the regulatory levels for classifying a solid waste as a RCRA characteristic hazardous waste based on Toxicity Characteristic Leaching Procedure (TCLP) results. These regulations are applicable if remedial actions involve the generation of solid wastes.~~

~~Standards Applicable to Generators of Hazardous Waste (40 CFR 262) indicate that a generator that treats, stores, or disposes of hazardous waste on site must comply with these standards, which include manifest requirements, pre-transport requirements (i.e., packaging, labeling, placarding), recordkeeping, and reporting. These standards are applicable if remedial actions involve generation of hazardous waste.~~

~~Standards for Hazardous Waste TSD Facilities (40 CFR 264) are potentially applicable to onsite remedial actions involving hazardous wastes and offsite facilities receiving hazardous waste from the site for treatment or disposal. Standards for TSD facilities include requirements for preparedness and prevention, releases from SWMUs (i.e., corrective action requirements), closure and post-closure care, use and management of containers, and design and operating standards for tank systems, surface impoundments, waste piles, landfills, incinerators, and miscellaneous units. When a site or portion thereof receives a CAMU designation, the designated area qualifies for certain exemptions from RCRA Subtitle C requirements. A temporary unit, such as a waste pile that is only used for a short time during remediation, also qualifies for certain exemptions.~~

~~RCRA LDRs (40 CFR 268) restrict certain wastes from being placed or disposed on the land unless they meet specific best demonstrated available technology (BDAT) treatment standards (expressed as concentrations, total or in the TCLP extract, or as specified technologies). Removal and treatment of a RCRA hazardous waste or movement of the waste outside of a CAMU, thereby constituting "placement," would trigger the LDRs. It is anticipated that either universal treatment standards (40 CFR 268.48) or alternative LDR treatment standards for contaminated soil (40 CFR 268.49) would be applicable to OU2 if contaminated soil meets hazardous waste criteria after excavation or if other hazardous wastes are generated during remedial action. However, LDRs would not be applicable to onsite treatment of excavated soil and reuse of treated soil. LDRs would be applicable to offsite disposal of soil from the site.~~

~~RCRA Standards [55 Federal Register (FR) 30798; 40 CFR 264, Subpart S] applies special standards for cleanup at CAMUs and is required to implement remedial activities under 40 CFR 264.101 and RCRA 308(h) or to implement remedial activities at facilities not subject to 40 CFR 264.101. This regulation provides clarification that RCRA Standards are applicable to any SWMUs. This requirement is potentially~~

~~relevant and appropriate for management of remediation wastes (e.g., staging piles) if remedial action involves excavation and staging of hazardous wastes at OU2.~~

~~RCRA Tank System Requirements (40 CFR 264, Subpart J) apply to owners and operators of facilities that use tank systems to store or treat hazardous waste. These regulations are applicable if remedial activities include storage/treatment of hazardous waste at OU2.~~

~~RCRA Miscellaneous Unit Requirements (40 CFR 264, Subpart X) apply to owners and operators of facilities that treat, store, or dispose of hazardous waste in miscellaneous units. These regulations are applicable if remedial activities at OU2 include treatment/storage/disposal of hazardous wastes in miscellaneous units.~~

~~USEPA PCB Spill Cleanup Policy (40 CFR 761, Subparts D, N, and O) regulates PCB manufacturing, processing, distribution in commerce, and use prohibitions (40 CFR 761). Subpart D applies to the storage and disposal of PCB-contaminated wastes. Disposal of PCB-contaminated waste is regulated under 40 CFR 761.60. Cleanup and disposal options for PCB remediation wastes containing greater than 50 mg/kg is regulated under 40 CFR 761.61. For remedial actions at OU2, Subpart D would be potentially applicable as an action-specific ARAR if PCB-contaminated excavated soil exceeding 50 mg/kg PCBs is sent for offsite disposal or treatment at a facility approved under this Subpart. However, if concentrations are less than 50 mg/kg, then Subpart D would be used as relevant and appropriate rather than applicable. Subparts N and O govern sampling and verification of cleanup levels. Depending on the remedial action alternative, these subparts could be relevant and appropriate.~~

~~RCRA Subtitle D provides criteria for the disposal of non-hazardous wastes and may be potentially applicable if material removed from OU2 is classified as non-hazardous.~~

~~National Ambient Air Quality Standards (40 CFR 50 and 53) are not included because the state ambient air quality standards provide the emissions standards for air pollutants necessary to attain the National Ambient Air Quality Standards.~~

State of Maine

Maine Hazardous Waste Management Rules (06-096 CMR Parts 800, 801, 850, 851, and 857) provide standards for the generation, transportation, treatment, storage, and disposal of hazardous waste. Therefore, these performance standards would be applicable if hazardous waste is generated, transported, treated, stored, or disposed as part of a remedial action at OU2. The following summarizes the specific standards.

Identification and Discharge of Hazardous Matter (06-096 CMR Parts 800, 801) identifies those solid wastes that are subject to regulation as hazardous and outlines the procedures for treatment or cleanup of discharges. The procedures for discharge reporting are also included in these rules. These standards are applicable if remedial actions involve generation of hazardous waste.

Identification of Hazardous Wastes (06-096 CMR Part 850) refers to the federal RCRA regulations for Identification and Listing of Hazardous Wastes (40 CFR Part 261), which identify those solid wastes that are subject to regulation as hazardous wastes. Hazardous wastes are listed, and test procedures are outlined to determine characteristic hazardous wastes. Requirements in 40 CFR Part 261.24 identify the regulatory levels for classifying a solid waste as a RCRA characteristic hazardous waste based on Toxicity Characteristic Leaching Procedure (TCLP) results. These regulations are applicable if remedial actions involve the generation of solid wastes.

Standards for Generators of Hazardous Waste (06-096 CMR Part 851) indicate that a generator that treats, stores, or disposes of hazardous waste on site must comply with these standards, which include manifest requirements, pre-transport requirements (i.e., packaging, labeling, placarding), recordkeeping, and reporting. These standards are applicable if remedial actions involve generation of hazardous waste.

Hazardous Waste Manifest Requirements (06-096 CMR Part 857) set forth rules for generators of hazardous waste that require them to track the movement of hazardous waste from the point of generation to any intermediate points and finally to its ultimate disposition by use of a manifest. This rule refers to Standards Applicable to Generators of Hazardous Waste (40 CFR Part 262), which indicates that a generator that treats, stores, or disposes of hazardous waste on site must comply with these standards, which include manifest requirements, pre-transport requirements (i.e., packaging, labeling, placarding), recordkeeping, and reporting. These standards are applicable if remedial actions involve generation of hazardous waste.

~~provide standards for the generation, transportation, treatment, storage, and disposal of hazardous waste. The rules establish performance standards for hazardous waste landfills including migration of hazardous wastes, constituents, or derivatives into ground and surface waters of the state. Hazardous waste includes federally regulated (RCRA) hazardous waste. Facilities for which standards for the location, design, construction, operation, maintenance, management, and closure are provided include landfills, surface impoundments, land treatment facilities, waste piles, storage facilities, and incinerators. The regulations also provide standards for detailing groundwater monitoring requirements for hazardous waste facilities. The regulations outline general groundwater monitoring standards for detection monitoring, compliance monitoring, and corrective action monitoring. The state provisions are generally more stringent than the federal regulations, and the State of Maine has RCRA delegation. Therefore,~~

~~these performance standards would be applicable if hazardous waste is generated, transported, treated, stored, or disposed as part of a remedial action at OU2.~~

~~Maine Ambient Air Quality Standards (38 MRSA 584; 06-096 CMR 110) are established for particulate matter, sulfur dioxide, carbon monoxide, ozone, hydrocarbons, nitrogen dioxide, lead, and total chromium. This regulation also establishes ambient increments that define the maximum ambient increase of a particular pollutant that can be permitted for a given area depending on the classification of that area. These requirements are applicable if remedial actions at OU2 include discharges to ambient air (e.g., fugitive dust during excavation).~~

~~Maine Air Pollution Control Law – Classification of Air Quality Control Regions (38 MSRA 583; 06-096 CMR 114) establishes and classifies air quality regions. PNS is located in the Metropolitan Portland Air Quality Region which is a Class II region and a nonattainment area for ozone. These requirements are applicable if remedial actions at OU2 include discharges to ambient air.~~

~~Maine Air Pollution Control Laws – Maine Emission License Requirements (38 MSRA 585 and 590; 06-096 CMR 115) require new source of air emissions to demonstrate that their emissions do not violate ambient air quality standards. New sources must meet pre-construction and post-construction monitoring requirements. These requirements are applicable if remedial actions at OU2 include discharges to ambient air.~~

Maine Statewide Water Quality Criteria (SWQC) are set forth in the Maine Surface Water Toxics Control Program (38 MSRA Parts 420 and 464; 06-096 CMR Part 530) regulations, which also establish procedures for the control of toxic pollutants in surface waters. SWQC are set at federal NRWQC levels. Discharges of treated water to a surface water body may occur for alternatives that would require water management during soil excavation. The substantive requirements would be met if any discharges of treated water to surface water bodies are required.

~~Maine Surface Water Toxics Control Program (38 MSRA 420 and 464; 06-096 CMR 530) allows for the toxicity of hazardous substances on organisms, as well as the persistence and degradability of the hazardous substance, to be considered in determining cleanup levels. Additionally, it allows for consideration of the impacts associated with the discharge stream flow rate. These regulations are applicable if remedial activities include discharge to receiving streams at OU2.~~

Maine Waste Discharge Licenses (38 MRSA 413 et seq.) and Waste Discharge Permitting Program (06-096 CMR 520 – 629) provides standards that regulate the discharge of pollutants from point sources.

These standards would be applicable to alternatives that require management during soil excavation and where discharges of treated water to s a surface water body may occur.

Erosion and Sedimentation Control (38 MRSA Part 420-C) and Stormwater Management (38 MRSA Part 420-D; 06-096 CMR Parts 500 and 502) regulations require erosion control measures be in place before activities such as filling, displacing, or exposing soil or other earthen materials occur. These regulations are applicable if remedial activities include earth moving at OU2. Substantive requirements of these regulations would need to be met to minimize erosion of material into the Piscataqua River.

Maine Solid Waste Management Regulations (06-096 CMR Parts 400 ~~to~~ and 411) provide standards for the generation, transportation, treatment, storage, and disposal of solid waste and special waste. A solid waste facility requires a license pursuant to the Maine Site Location Law and Maine Solid Waste Law. Solid wastes generated from remedial action at OU2 would be disposed at appropriately licensed and permitted facilities.

~~Uniform Environmental Covenants Act (MRSA Title 38, Chapter 31) creates a statutory mechanism for creating, modifying, enforcing, and terminating environmental covenants. The environmental covenants created under this act are based on traditional property law principles and are recorded in the local land records and bind successive owners of the property. State and local governments, and potentially others, have clear rights to enforce the land use restrictions and thereby ensure with greater certainty the protection of human health and the environment throughout the life of the land use restriction and through various real estate transactions or legal issues. OU2 is located on a federal facility; therefore, mechanisms for environmental covenants, including land use restrictions, are governed by the appropriate federal guidelines. However, this act is considered relevant and appropriate for remedial actions at OU2 that include land use restrictions.~~

Maine Visible Emissions Regulations (38 MSRA Part 584; 06-096 CMR Part 101) establish opacity limits for emissions from several categories of air contaminant sources, including general construction activities. These regulations would be considered for alternatives that have the potential to impact air quality. These standards would be met if any of the alternatives result in emission of particulate matter and fugitive matter to the atmosphere (e.g., dust generation).

2.2 MEDIUM OF CONCERN

The medium of concern that poses a potential unacceptable risk that needs to be addressed in this FS includes the surface and subsurface soil at OU2. Soil is a medium of concern because concentrations of COCs are at levels greater than acceptable risk levels for human health exposure and because of the future potential for erosion of onsite soil to the offshore area if shoreline erosion control measures are

removed or compromised. The current land uses are of an industrial/occupational nature at Site 6 and Site 29, and residential (military) and occupational at the DRMO Impact Area. There are no recreational facilities at OU2, although a portion of Site 29 is covered with grass and could be accessed by people at the Shipyard. The future land uses are industrial/occupational, recreational, and residential. Additionally, currently or in the future, construction activity could potentially occur anywhere within OU2. Consistent with the OU2 risk assessment (see Section 1.0), the depth of concern for industrial/occupation, recreational, or residential exposure is (0 to 2 feet bgs), whereas a construction worker could be exposed to surface and subsurface soil, depending on the depth of construction activities. For construction worker exposure, a subsurface depth to the groundwater table or a maximum depth of 10 feet bgs is used for typical construction work. However, soil outside of the waste disposal area was found to an average depth of 6 feet bgs at which point a rock fragment fill layer began that had little to no soil. This average depth was used for estimation of volume of contaminated material for the FS.

The volume of soil is based on the horizontal and vertical extent of the remediation areas based on the receptor and PRGs for each receptor. The PRGs are discussed further in Section 2.4, and the corresponding volumes of soil to be addressed are discussed in Section 2.5.

2.3 REMEDIAL ACTION OBJECTIVES

RAOs are medium-specific goals for protecting human health and the environment. RAOs are required to specify the contaminants of concern, exposure routes and receptors of concern, and an acceptable contaminant level or range of levels for each exposure route. Acceptable contaminant levels are based on site-specific PRGs as a starting point, after which a final remediation goal is determined when a remedy is selected.

As discussed in Section 1.6, potential human health risks concerns have been identified for certain receptors that may be exposed to soil contaminants at OU2. In addition, erosion of soil from the shoreline of OU2 has been noted. The erosion of the OU2 shoreline has been identified as the likely mechanism for the elevated concentrations of certain metals (especially lead) in offshore sediment. Based on an understanding of these potential human health and environmental risks, the following RAOs have been developed for OU2:

1. Prevent human exposure through ingestion, dust inhalation, and dermal contact to contaminated soil with COC concentrations that exceed PRGs (concentrations causing unacceptable risk).
2. Protect the offshore environment from erosion of contaminated soil from the OU2 shoreline.
3. Prevent unacceptable risk from future potential migration of contaminants from unsaturated zone soil to groundwater in the interim capped area.

The PRGs are the chemical-specific goals for representative site concentrations (based on the exposure concentration) that, when achieved, will result in site concentrations that pose an acceptable risk for the targeted receptor. PRGs have been developed on a receptor-specific basis for protection of human health from exposure to soil contaminants. The developed PRGs were used to determine the remediation areas and volumes to be addressed by this FS. The PRGs and associated remediation areas and volumes are discussed in the following sections.

2.4 REMEDIATION GOALS FOR OU2

A discussion of the development of PRGs and remediation areas can be found in Appendix A.

Current, likely future, and hypothetical future site uses were used in the development of PRGs for the receptors that may be exposed to contaminated soil at OU2. Exposure to surface soil (0 to 2 feet bgs) was considered for occupational, residential, and recreational receptors, and exposure to surface and subsurface soil (0 to 10 feet bgs) was considered for construction workers.

Most of OU2 and adjacent areas are currently used for occupational activities (DRMO Storage Yard, dumpster storage area, Buildings 298 and 310, and west of the DRMO Storage Yard). ~~The Shipyard does not have plans to change land use for these areas; therefore, occupational use of these areas is anticipated to continue.~~ The northern portion of OU2 has military residences. ~~There are no current plans to change land use for this area; therefore, residential use is anticipated to continue.~~ Residential use of current occupational areas is considered a hypothetical future land use. Although the existing residences are for military use (3-year tour of duty), residential PRGs were developed based on child (for non-carcinogens) and life-long (for carcinogens) residential exposures. There are no current plans to change land use for these areas.

Recreational facilities are not present within the occupation areas, but there are no restrictions to access the grassy area around Buildings 298 and 310. The grassy area is considered the most likely area where potential exposure to contaminated soil during recreational activities would occur. The other occupational areas are fenced and asphalted or interim capped; therefore, recreational exposure to contaminated soil in asphalted or interim capped areas is not a current or likely future exposure route for these areas.

Construction activities are anticipated to be limited at OU2; there are no plans to construct additional buildings based on current land use. Therefore, construction worker exposure to contaminated soil is most likely to occur during utility repair or upgrade that requires excavation of soil. Based on the anticipated limited construction activities, exposure to contaminated soil would be of short duration (likely less than 30 days and not more than 60 days).

Risk-based PRGs were developed for most of the OU2 COCs. ARAR-based PRGs were used for dioxins/furans. The following risk-based PRGs for OU2 were evaluated for the targeted receptors discussed previously.

COC	PRG for Receptor (1)			
	Construction Worker (mg/kg)	Occupational User (mg/kg)	Recreational User (mg/kg)	Resident (mg/kg)
Antimony (N)	516	681	3930	73
Copper (N)	51,600(2)	68,100(1)	393,000(2)	7,300
Lead	~~4,000 (30-day)~~ 2,000 (60-day)	1,600	4,600	400
Nickel (N)	25,800(2)	34,100(2)	21,100(2)	3,650
PAH (BaPeq) (C)	45(2)	2.0	5.0	0.676
PCB (total) (C)	155(2)	6.0	34	1

(1) PRGs are based on 5 x 10^{-6} risk for carcinogens (C) and an HI of 1 for non-carcinogens (N). Lead PRG is based on lead exposure modeling discussed in Attachment 1 of Appendix A.
(2) The maximum detection in soil was less than the PRG for this receptor.

PRG development for antimony, copper, lead, nickel, PAHs, and PCBs is discussed in detail in Appendix A. PAH PRGs are based on benzo(a)pyrene (BAPeq) equivalent toxicity for carcinogenic PAHs. PCB PRGs are based on total PCBs. Remediation areas that address lead and copper contamination will also address contamination from the other OU2 COCs. Therefore, lead was determined to be the primary contaminant and copper the secondary contaminant for estimating remediation areas and volumes. Dioxins/furans exposure concentrations, expressed in terms of 2,3,7,8-TCDD equivalents, were evaluated separately from the other COCs. Based on comparison of the Upper Confidence Limit (UCL) of the mean to the residential and industrial ARARs of 1 ug/kg and 20 ug/kg, no action would be required as a result of the presence of dioxins/furans (see Appendix A). As discussed in Appendix A, Toxic Substance Control Act (TSCA) PCB Disposal Regulations are not applicable to OU2 because PCB concentrations are less than 50 mg/kg (see Appendix A).

2.5 REMEDIATION AREAS AND VOLUMES

Due to the distribution of antimony, nickel, PAHs, and PCBs, remediation areas based on lead and copper would result in the exposure point concentrations (EPCs) for antimony, nickel, PAHs, and PCBs being less than PRGs. Therefore, areas and volumes of soil for each receptor were estimated by evaluating the area and volume of soil that would need to be remediated so that the lead and copper EPCs for the exposure unit would be equal to or less than the PRG. The estimation of remediation areas and volumes assumed that lead and copper contamination in the yards of Quarters S and N (north of the DRMO Storage Yard) would be addressed separately as part of a removal action conducted before

selection of a final remedy for OU2; ~~se~~therefore, they are not included in the following discussion. The figures and calculations supporting the estimation of the areas and volumes are included in Appendix A.

The remediation areas for residential, occupational, and construction (industrial) worker exposure are shown on Figures 2-1, 2-2~~1~~ and 2-3, respectively. Also depicted on these figures is the area of lead and copper contamination in the yards of Quarters S and N that is being evaluated separately. The remediation areas shown on these figures were based on the distribution of contamination and current site features including the DRMO area, the interim capped area, the w~~W~~aste d~~D~~isposal a~~A~~rea, and the shoreline protection area. The DRMO area includes locations that have not been capped and have OU2 contamination where DRMO Storage Yard activities occurred or were likely impacted by the DRMO S~~s~~torage activities. The interim capped area includes the area of the DRMO that was capped as part of the interim remedy in 1993. The boundary of the waste disposal area is based on the extent of waste material observed in borings and contaminant distribution around the waste disposal areas.

The remediation areas for residential and occupational exposure ~~for this FS~~ were based on soil lead concentrations exceeding 400 mg/kg (the distributions of locations with lead concentrations exceeding 400 mg/kg, 800 mg/kg, and 1,000 mg/kg were not significantly different) and 1,600 mg/kg (distribution of locations with lead concentrations exceeding 1,600, 2,000, and 4,000 mg/kg were not significantly different), respectively. There are four exceptions to the remediation areas for residential and occupational exposure being defined by lead concentrations greater than 400 mg/kg and 1,600 mg/kg, respectively. The entire fenced area used for dumpster storage was included in the remediation area for residential users because any remedial action based on residential exposure would likely include the entire area and not just a portion of the area. This area was excluded from the remediation area for occupational workers because only one location exceeded 1,600 mg/kg (concentration was less than 2,000 mg/kg), indicating that a lead exposure concentration for this area would not exceed the PRG of 1,600 mg/kg. The area near the entrance to the DRMO Storage Yard was included in the remediation area because it may have been impacted by snow contaminated with lead from the soil that was plowed into this area. There is uncertainty in the western OU2 boundary (shown as a dashed line on Figures 2-1, 2-2, and 2-3). A pre-design investigation will be conducted to determine the extent of contamination in this area and whether the OU2 boundary will be extended. ~~The area approximately 300 feet west of the DRMO Storage Yard was not included because it was not likely impacted by DRMO Storage Yard activities. However, the area near the entrance to the DRMO Storage Yard was included in the remediation area because it may have been impacted by snow contaminated with lead from the soil that was plowed into this area. The area around Building 348 was not included because sampling in the area and adjacent to the east-southeast did not indicate there was significant lead contamination or that the DRMO Storage Yard activities impacted this area. Finally, the area including the bedrock outcrop to the~~

~~west and northwest of Building 310 was not included because there were only pockets of soil on the outcrop, which do not represent a significant risk to human health or the environment.~~

For estimating the volume of soil for residential exposure, surface and shallow subsurface lead concentrations were considered in the DRMO Storage Yard area (90,500 square ~~foot~~feet ~~area~~), the c~~C~~apped a~~A~~rea (61,500 square feet), and the waste disposal area (33,600 square feet). Including shallow subsurface soil in the remediation volume for residential exposure would address the potential for exposure to shallow subsurface soil if this soil was excavated and deposited on the ground surface (and thus becoming surface soil). On average, ~~R~~rock fragment fill with little soil was found approximately 6 feet bgs; therefore, a depth of 6 feet bgs was used for volume calculations. ~~t~~The depth of excavation of soil would be to the top of the rock fragment fill layer within the DRMO area and c~~C~~apped area. This would achieve the remedial goal of the removal of contaminants to a depth where the material is predominantly rock, not soil, for excavation alternatives. The waste disposal area averages a depth of 15 feet bgs. The volume of soil requiring removal from the OU2 area to achieve residential exposure would be 20,100 cubic yards from~~,~~ the DRMO area, 13,700 cubic yards from~~form~~ the ~~capped~~interim capped area, and 18,700 cubic yards from the waste disposal area for a total of 52,500 cubic yards.

Remediation through implementation and maintenance of access controls or surface protection, and requirements for management of excavated soil for the entire site would prevent residential exposure to unacceptable levels of lead. This assumes that the controls, protection, and requirements would be effectively maintained in the long term. Remediation through excavation of all of the soil and backfilling with clean fill would reduce the lead concentrations in soil at the site to the concentration in the soil used for backfilling, which is assumed ~~to~~ would be 40 mg/kg or less. Reduction of lead concentrations through treatment (in situ or ex situ with backfilling) would depend on the treatment goals for the treatment technology. However, to meet residential use requirements, treatment goals for in-situ treatment or backfill of treated material would likely need to be 400 mg/kg or less to meet the residential PRG of 400 mg/kg.

~~The remediation area for occupational users was based on lead concentrations exceeding 1,6000 mg/kg (distribution of locations with lead concentrations exceeding 1,600, 2,000, and 4,000 mg/kg were not significantly different from residential). There were four exceptions to the remediation area being developed based on lead concentrations exceeding 1,600 mg/kg. The entire fenced area used for dumpster storage was not included in the remediation area. This area was excluded because only one location exceeded 1,600 mg/kg (concentration was less than 2,000 mg/kg), indicating that a lead exposure concentration for this area would not exceed the PRG of 1,600 mg/kg. The area west of the DRMO Storage Yard entrance was not included because it is not within the area used for occupational use and lead concentrations slightly exceeded 1,600 mg/kg, indicating that it would not represent a~~

~~significant risk to occupational workers. The area around Building 348 was not included because sampling in the area and adjacent to the east-southeast did not indicate there was lead contamination or that the DRMO Storage Yard activities impacted this area. The area including the bedrock outcrop to the west and northwest of Building 310 was not included because there were only pockets of soil on the outcrop, which do not represent a significant risk to human health or the environment.~~

For the construction worker exposure, the remediation area was based on soil lead concentrations exceeding 4,000 mg/kg. Addressing the area contaminated with lead at concentrations greater than 4,000 mg/kg would likely result in exposure concentrations less than the construction worker PRG based on 60-day exposure (2,000 mg/kg) and less than the occupational user PRG (1,600 mg/kg).

For estimating the volume of soil for construction worker exposure, surface and shallow subsurface lead concentrations were considered in the DRMO area and the interim c~~C~~apped area, to the top of the rock fragment fill layer (approximately 6 feet bgs). The waste disposal area averages a depth of 15 feet bgs. The volume of soil requiring removal from the OU2 area to achieve the occupational and construction worker exposure would be 4,600 cubic yards from the DRMO area, 13,700 cubic yards ~~form~~ from the interim capped area and 18,700 cubic yards from the waste disposal area for a total of 37,000 cubic yards.

TABLE 2-1

CHEMICAL-SPECIFIC ARARs AND TBCs
OPERABLE UNIT 2 FEASIBILITY STUDY REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
PAGE 1 OF 3

Medium/Activity	Requirement/ Citation	Status	Synopsis	Evaluation/Action To Be Taken
FEDERAL				
Soil/Risk Assessment	Office of Solid Waste and Emergency Response (OSWER) Directive 9355.4-12	To be considered (TBC)~~TBC~~	~~USEPA~~ United States Environmental Protection Agency (USEPA) has provided recommended methodology for assessing risk caused by exposure to lead in surface soil under residential scenarios.	Guidelines were used to develop risk-based cleanup goals for lead in soil.~~Can be used to develop PRGs for lead.~~
	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. (USEPA, January 2003)	TBC	USEPA has provided recommended methodology for assessing risks to adult receptors caused by exposure to lead in soil under residential and commercial/industrial scenarios.	Guidelines were used to develop risk-based cleanup goals for lead in soil.
	USEPA Risk Reference Doses (RfDs) from Integrated Risk Information System (IRIS)	TBC	RfDs are estimates of daily exposure for human populations (including sensitive subpopulations) considered unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure over a lifetime.	RfDs were used to develop risk-based soil cleanup goals for non-carcinogenic contaminants of concern (COCs).~~RfDs were used to estimate non-carcinogenic risk as part of the HHRA for OU2 and can be used to develop soil cleanup goals.~~
	USEPA Human Health Assessment Group Cancer Slope Factors (CSFs) from IRIS	TBC	CSFs present the most up-to-date information on cancer risk potency for known and suspected carcinogens.	CSFs were used to develop risk-based soil cleanup goals for carcinogenic COCs.~~CSFs were used to estimate carcinogenic risk as part of the Human Health Risk Assessments (HHRA) for OU2, but were not needed for development of soil cleanup goals for OU2.~~

TABLE 2-1

CHEMICAL-SPECIFIC ARARs AND TBCs
OPERABLE UNIT 2 FEASIBILITY STUDY REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Medium/Activity	Requirement/ Citation	Status	Synopsis	Evaluation/Action To Be Taken
	USEPA Regional Screening Levels for Chemical Contaminants at Superfund Sites (RSLs)9 PRGs (October 2004)	TBC	In 2008 USEPA replaced region-specific risk-based screening levels with RSLs. These are risk-based USEPA Region 9 developed risk-based concentrations for contaminants in soil, air, and tap water to assist risk assessors and others in initial screening-level evaluations of environmental measurements.	USEPA risk-based screening levels were considered as part of the development of soil cleanup goals.USEPA Region 9 PRGs were used as risk screening levels as part of the HHRA for OU2 and can be used to develop soil cleanup goals.
	Guidelines for Carcinogen Risk Assessment EPA/630/P-03/001F (March 2005)	TBC	These guidelines are used to perform Human Health Risk Assessment (HHRA). They provide a framework for assessing possible cancer risks from exposures to pollutants or other agents in the environment.	These guidelines were used to develop risk-based soil cleanup goals for carcinogenic COCs.
	Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens EPA/630/R-03/003F (March 2005)	TBC	These guidelines are used to perform HHRA and address a number of issues pertaining to cancer risks associated with early-life exposures in general and provide specific guidance on potency adjustment for carcinogens acting through a mutagenic mode of action.	This guidance was used to develop risk-based soil cleanup goals for carcinogenic COCs.
STATE				
Soil/Risk Assessment	Guidance Manual for Human Health Risk Assessments at Hazardous Substance Sites (MEDEP and Maine Department of Human Services, June 1994)	TBC	This guidance manual provides acceptable carcinogenic and non-carcinogenic risk levels ($1x10^{-5}$ and 1, respectively)	This guidance manual can be used for risk management decisions at OU2.

TABLE 2-1

CHEMICAL-SPECIFIC ARARs AND TBCs
OPERABLE UNIT 2 FEASIBILITY STUDY REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Medium/Activity	Requirement/ Citation	Status	Synopsis	Evaluation/Action To Be Taken
Soil/Risk Assessment	Maine Remedial Action Guidelines (RAGs) for Soil Contaminated with Hazardous Substances (MEDEP, January 2010) ~~Remedial Action Guidelines (MEDEP, May 1997)~~	TBC	The Maine RAGs provide procedures to determine soil cleanup levels. ~~Maine has developed c~~Chemical-specific guidelines that may assist in making remedial decisions ~~at OU2~~are also provided. Guidelines are presented for four exposure scenarios.	These guidelines can be used to develop soil cleanup goals.

ARAR – Applicable or Relevant and Appropriate Requirement
COC – Contaminant of Concern
CSFs - Cancer Slope Factors
HHRA - Human Health Risk Assessment
IRIS - Integrated Risk Information System
MEDEP - Maine Department of Environmental Protection
OSWER - Office of Solid Waste and Emergency Response
RAG – Remedial Action Guideline
RfDs - Reference Doses
RSL – Regional Screening Level
TBC - To be considered
USEPA - United States Environmental Protection Agency

TABLE 2-2

LOCATION-SPECIFIC ARARs AND TBCs
OPERABLE UNIT 2 FEASIBILITY STUDY REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Requirement	Citation	Status[1]	Synopsis	Evaluation / Action To Be Taken
FEDERAL				
~~Floodplain~~	~~Federal Floodplain Management, E.O. 11988 (40 CFR 6, Appendix A)~~	~~Potentially Applicable~~	~~If no practicable alternative exists to performing cleanup in a floodplain, potential harm must be mitigated and actions taken to preserve the beneficial values of the floodplain.~~	~~If activities at OU2 potentially impact the floodplain of the Piscataqua River, activities that would reduce adverse impacts would be considered and implemented, as appropriate. It is anticipated that remedial actions for soil at OU2 would not adversely affect the floodplain.~~
Coastal Zone	Coastal Zone Management Act [~~(~~16 United States Code (USC) 1451 *et seq.*]~~)~~	~~Potentially~~ Applicable	This act provides for the preservation and protection of coastal zone areas. Federal activities that are in or directly affecting the coastal zone must be consistent, to the maximum extent practicable, with a federally approved state management program.	~~If~~ Applicable for onshore remedial actions at Operable Unit (OU) 2 that would ~~potentially~~ impact the coastal zone., Aactivities that would reduce adverse impacts would be considered and implemented, as appropriate to meet the substantive requirements of this act. Maine Department of Environmental Protection (MEDEP) would be included in the review of remedial designs and work plans to meet the substantive requirements of this act.
~~Navigable Waters~~	~~River and Harbors Act Section 10 (33 USC 403; 33 CFR 320, 322, and 323)~~	~~Potentially Applicable~~	~~Section 10 of the River and Harbors Act prohibits unauthorized obstruction or alteration of navigable waters. Activities involving excavation or deposition of materials in navigable waters or affecting such waters must serve the public interest, and benefits must outweigh adverse impacts on natural resources, aesthetics, and navigation.~~	~~Remedial alternatives would be designed such that navigable waters would not be obstructed or altered.~~

TABLE 2-2

LOCATION-SPECIFIC ARARs AND TBCs
OPERABLE UNIT 2 FEASIBILITY STUDY REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

	Requirement	Citation	Status[1]	Synopsis	Evaluation / Action To Be Taken
	~~Wetlands~~	~~Federal Protection of Wetlands, EO 11990 / 40CFR§6, Appendix A, CWA Section 404, and 40CFR§§230 and 231~~	~~Potentially Applicable~~	~~Appendix A includes the federal policy on wetlands protection. Under this order, federal agencies are required to minimize the destruction, loss, or degradation of wetlands, and preserve and enhance natural and beneficial values of wetlands. If no practicable alternative exists to remedial activity that may adversely affect a wetland, impacts from implementing the chosen alternative must be mitigated.~~	~~A wetlands functions and values assessment would be conducted to guide mitigative efforts for any adverse impacts that may occur to wetlands during remedial activities. However, there has been no wetlands identified at OU2 during past projects.~~
	Wetlands and US Waters	Clean Water Act (CWA) Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR Parts 230-232; 33 CFR Parts 320-330)	~~Potentially~~ Applicable	These regulations outline the requirements for ~~Section 404 of the CWA regulates~~ the discharge of dredged or fill material into US waters, including wetlands. ~~The purpose of Section 404 is to ensure that proposed discharges are evaluated with respect to impacts on the aquatic ecosystem.~~ No activity that adversely affects a ~~wetland~~ US waters is permitted if a practicable alternative that has less effect is available. If there is no other practicable alternative, impacts must be mitigated.	This act would be applicable to remedial actions that could potentially include discharge of excavated material or wastewater to the offshore area. The substantive requirements of the standards would be met if any alterations were made to the watercourse. ~~A wetlands functions and values assessment would be conducted to guide mitigative efforts if wetlands could be adversely impacted during remedial activities.~~

TABLE 2-2

LOCATION-SPECIFIC ARARs AND TBCs
OPERABLE UNIT 2 FEASIBILITY STUDY REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

	Requirement	Citation	Status[1]	Synopsis	Evaluation / Action To Be Taken
	Historic Preservation	National Historic Preservation Act (16 USC 470 *et seq.*; 36 CFR Part 800)	~~Potentially~~ Applicable	Provides requirements relating to potential loss or destruction of significant scientific, historical, or archaeological data due to remedial actions at a site.	Prehistoric and historical archeological resource sensitivity for the Defense Reutilization and Marketing Office (DRMO) Impact Area (particularly near Quarters S and N) are moderate and high, respectively. The rest of OU2 has low or moderate sensitivity for prehistoric and historic archaeological resources. The State Historic Preservation Officer (SHPO) would be contacted and the remedial design and work plans would be developed to meet the substantive requirements of this act. ~~OU2 is low. If excavation activities are included in a remedial action at OU2, measures would be needed to protect resources of historical value, if present.~~
	Other Natural Resources	The Endangered Species Act of 1973 (16 USC 1531 *et seq.*; 50 CFR Part 200, 402) ~~Chapter 35)~~	~~Potentially~~ Applicable	Provides for consideration of impacts to endangered and threatened species and their critical habitats. Requires federal agencies to ensure that any action carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or adversely affect its critical habitat. The entire state of Maine is considered a habitat of the federally-listed endangered short-nosed sturgeon.	Remedial activities would be conducted so as to avoid any adverse effect under the Act to the short-nosed sturgeon. ~~No known endangered or threatened species or critical habitats exist at PNS. For this reason, the Endangered Species Act is not considered relevant and appropriate. However, special consideration may be required for remedial action that could disturb certain nesting seabirds.~~

TABLE 2-2

LOCATION-SPECIFIC ARARs AND TBCs
OPERABLE UNIT 2 FEASIBILITY STUDY REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

	Requirement	Citation	Status[1]	Synopsis	Evaluation / Action To Be Taken
		Fish and Wildlife Coordination Act (~~/~~ 16 USC 661 ~~through 666, 33CFR§320; 40CFR§6.302~~*et seq.*)	~~Potentially Relevant and Appropriate~~ Applicable	This act requires any federal agency proposing to modify a body of water to ~~consult~~ coordinate with the ~~U.S.~~United States Fish and Wildlife Service or National Marine Fisheries Service and appropriate state agencies if alteration of a body of water, including discharge of pollutants into a wetland or construction in a wetland, will occur as a result of offsite remedial activities. ~~Consultation is strongly recommended for onsite actions.~~	This act would be applicable to remedial actions at OU2 that may impact the coastal flood plain or adjacent river. Activities that would reduce adverse impacts would be considered and implemented as appropriate after coordination with USFWS and NMFS. ~~Precautions must be taken to minimize the potential adverse impacts to fish and wildlife during remedial activities.~~
STATE					
	Other Natural Resources	Maine Site Location of Development Law (38 Maine Revised Statutes Annotated [MRSA] 481 *et seq.*; 06-096 Code of Maine Rules [CMR] Parts 371-377)	~~Potentially~~ Relevant and Appropriate	This statute and the related regulations prohibit any development from adversely affecting existing uses, scenic character, or existing natural resources in or near a community. Remediation activities must not have adverse effect on the natural environment, historic sites, unusual natural areas, and wildlife and fisheries.	This regulation is applicable for remedial alternatives that cover more than 3 acres. ~~OU2 covers less than 3 acres.~~ Substantive requirements of this law would be met under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process in consultation with MEDEP. Remedial activities would be conducted so as not to have an adverse effect on the natural environment, historic sites, and wildlife and fisheries.
		~~Maine Endangered Species Act (12 MRSA 7751 et seq.)~~	~~Potentially Applicable~~	~~Designates species of fish and wildlife found in the State as endangered or threatened and identifies essential habitats for these species.~~	~~No known endangered or threatened species or essential habitats exist at PNS. However, special consideration may be required for remedial action that could disturb certain nesting seabirds~~

TABLE 2-2

LOCATION-SPECIFIC ARARs AND TBCs
OPERABLE UNIT 2 FEASIBILITY STUDY REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

	Requirement	Citation	Status[1]	Synopsis	Evaluation / Action To Be Taken
		~~Maine Significant Wildlife Habitat Rules (06-096 CMR 335)~~	~~Potentially Applicable~~	~~Outlines requirements for activities impacting significant wildlife habitats, including certain seabird nesting islands.~~	~~There are no wildlife habitats at OU2, but special consideration may be required for remedial actions that could disturb nesting seabirds, if present at or near OU2.~~
		Maine Natural Resources Protection Act Permit by Rule Standards (38 MRSA 480 *et seq.*; 06-096 CMR Part 305)	~~Potentially~~ Applicable	This act regulates activity conducted in, on, or over any protected natural resource or any activity conducted adjacent to and operated in such a way that material or soil may be washed into any freshwater or coastal wetland, great pond, river, stream, or brook.	~~If any work~~This act would be applicable to remedial activities that may disturb ~~involves the disturbance of~~ soil material near the shoreline of OU2~~,~~. Remedial actions ~~it~~ would be performed in compliance with the substantive requirements of this act. Potential adverse effects to existing natural resources would be evaluated.
	Wetlands	Maine Wetland Protection Rules ~~/~~ (06-096 CMR Part 310)	~~Potentially~~ Applicable	Standards are provided for protection of wetlands, as defined in MEDEP Ch. 1000 Guidelines for Municipal Shoreline Zoning Ordinances. ~~protection.~~ Jurisdiction under the Rules includes the area adjacent to the wetlands, which is the area within 75 feet of the normal high water line. Activities that have an unreasonable impact on wetlands are prohibited.	A wetlands functions and values assessment would be conducted to guide restorative efforts for wetlands that may be adversely impacted by remedial activities.
	Coastal Zone	Maine Coastal Management Policies (38 MRSA 1801 *et seq.*)	~~Potentially~~ Applicable	These policies provide for the regulation, conservation, beneficial use, and management of coastal resources.	Remedial actions at OU2 would need to be consistent with these policies. The substantive environmental and facility ~~-~~siting requirements of these standards would be addressed in consultation with MEDEP.

~~1 The term "potentially" is used when requirements ("applicable" or "relevant and appropriate") would be invoked only when certain remedial actions are taken.~~

TABLE 2-2

LOCATION-SPECIFIC ARARs AND TBCs
OPERABLE UNIT 2 FEASIBILITY STUDY REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

ARAR – Applicable or Relevant and Appropriate Requirement
CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act
CFR - Code of Federal Regulations
CMR - Code of Maine Rules
CWA – Clean Water Act
DRMO - Defense Reutilization and Marketing Office
~~E.O. - Executive Order~~
MEDEP - Maine Department of Environmental Protection
MRSA - Maine Revised Statutes Annotated
OU – Operable Unit
TBC – To Be Considered
USC - United States Code

TABLE 2-3

ACTION-SPECIFIC ARARs AND TBCs
OPERABLE UNIT 2- FEASIBILITY STUDY REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Requirement	Citation	Status (1)	Synopsis	Evaluation/Action To Be Taken
FEDERAL				
Surface Water	Clean Water Act (CWA) [33 United States Code (USC) §1251 *et seq.*]; National Recommended Water Quality Criteria (NRWQC) (40 CFR Part 122.44)CWA / 33 USC 1251 et seq.; 40CFR 122.44; and 40CFR§131	Potentially Relevant and Appropriate Relevant and Appropriate	These criteria are used to establish water quality standards for the protection of aquatic life. CWA are health-based criteria developed for carcinogenic and non-carcinogenic compounds and water quality parameters. CWA establishes guidelines for pollutants in surface water. CWA is also applicable for the protection of human health from exposure to contaminants in drinking water as well as from ingestion of aquatic biota and for the protection of freshwater and saltwater aquatic life.	These standards would be relevant and appropriate to alternatives that may impact the water quality of the Piscataqua River. Remedial activities would be conducted to reduce adverse impacts to the offshore. Stormwater management, erosion controls, and management of water discharges would be included in remedial activities, as appropriate. CWA would be used if surface water monitoring is required to measure the effectiveness of a remedial action at a compliance point based on full mixing, and to ensure that minimum cleanup levels are being met.
Water Management	CWA Section 402 National Pollutant Discharge Elimination System (NPDES) (40 CFR Parts 122-125)	Applicable	CWA Section 402 requires NPDES permits for any discharges to navigable waters.	These regulations would be applicable to alternatives that require water management during soil excavation and where discharges of treated water to a surface water body may occur. The substantive requirements would be met if any discharges of treated water to surface water bodies are required.

TABLE 2-3

ACTION-SPECIFIC ARARs AND TBCs
OPERABLE UNIT 2- FEASIBILITY STUDY REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Requirement	Citation	Status (1)	Synopsis	Evaluation/Action To Be Taken
FEDERAL (continued)				
Hazardous Waste	Resource Conservation and Recovery Act (RCRA) Subtitle C – Identification and Listing of Hazardous Wastes [40 Code of Federal Regulations (CFR) Part 261], Standards Applicable to Generators of Hazardous Waste (40 CFR Part 262), and Standards for Hazardous Waste Treatment, Storage and Disposal (TSD) Facilities (40 CFR Part 264) ~~; Toxicity Characteristic (40 CFR 261.24)~~	~~Potentially~~ Applicable/ Relevant and Appropriate/	RCRA regulations govern the generation transportation and disposal of hazardous waste. The State of Maine has RCRA delegation, and the Maine Hazardous Waste Management Rules provide references to the federal RCRA regulations where appropriate. ~~These requirements provide regulatory levels for classifying a solid waste as a RCRA characteristic hazardous waste.~~ ~~Defines those solid wastes that are subject to regulation as hazardous wastes under 40 CFR 262 through 265 and 40 CFR 124, 270, and 271.~~	These performance standards would be applicable if hazardous waste is generated, transported, treated, disposed, or stored as part of a remedial action at Operable Unit (OU) 2. ~~Applicable to alternatives that involve offsite transportation and disposal of hazardous waste.~~ Wastes generated during remedial actions would be analyzed to determine whether they are RCRA characteristic hazardous wastes. If analytical results exceed the standards in 40 CFR Part 261.24, the waste would be managed in accordance with RCRA Subtitle C requirements. RCRA regulations for capping would be relevant and appropriate for alternatives that include a RCRA C cap.
	~~RCRA Subtitle C – Standards Applicable to Generators of Hazardous Waste (40 CFR 262)~~	~~Potentially Applicable~~	~~These regulations establish standards for generators of hazardous waste.~~	~~Hazardous wastes generated during remedial actions would be managed in accordance with these regulations.~~

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ACTION-SPECIFIC ARARs AND TBCs
OPERABLE UNIT 2- FEASIBILITY STUDY REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Requirement	Citation	Status[1]	Synopsis	Evaluation/Action To Be Taken
Hazardous Waste (Continued)	RCRA Subtitle C – Standards for Hazardous Waste TSD Facilities (40 CFR 264)	Potentially Applicable	Establishes standards for acceptable management of hazardous waste.	These standards would be applicable for onsite treatment and storage of hazardous wastes. In addition, these standards would pertain to offsite waste disposal facilities. Wastes generated during remedial actions would be disposed at appropriately licensed and permitted facilities.
	Land Disposal Restrictions (40 CFR 268)	Potentially Applicable	Applicable to alternatives involving land disposal of hazardous wastes and requires treatment to diminish a waste's toxicity and/or, minimize contaminant migration. Treatment standards are provided.	Pertains to offsite waste disposal facilities. Wastes generated during remedial actions would be disposed at appropriately licensed and permitted facilities.
Solid Waste/Remediation Activities	RCRA Standards (40 CFR 264, Subpart S)	Potentially Relevant and Appropriate	Provides special standards for cleanup at Corrective Action Management Units.	This requirement is potentially relevant and appropriate for management of remediation wastes (e.g., staging piles) if remedial action involves excavation and staging of hazardous wastes at OU2.
	RCRA Subtitle C – Tank System Requirements / 40CFR§264, Subpart J	Potentially Applicable	These requirements apply to owners and operators of facilities that use tank systems to store or treat hazardous waste.	If tank systems are used to store materials that are hazardous waste, the tank systems would be managed in accordance with these requirements.
	RCRA Subtitle C – Miscellaneous Unit Requirements / 40CFR§264, Subpart X	Potentially Applicable	These requirements apply to owners and operators of facilities that treat, store, or dispose of hazardous waste in miscellaneous units.	If miscellaneous units are used to treat or store materials that are hazardous wastes, the units will be managed according to these requirements.

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ACTION-SPECIFIC ARARs AND TBCs
OPERABLE UNIT 2- FEASIBILITY STUDY REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Requirement	Citation	Status [1]	Synopsis	Evaluation/Action To Be Taken
Solid Waste/Remediation Activities (Continued)	USEPA PCB Spill Cleanup Policy / 40 CFR 761, Subparts D, N, and O	Relevant and Appropriate	Provides regulations governing disposal of PCB-contaminated waste (40 CFR 761.60) and cleanup and disposal options for PCB remediation wastes (40 CFR 761.61), which include PCB-contaminated environmental media. Subpart D applies to soils contaminated with PCB at concentrations greater than 50 mg/kg concentrations. Subparts N and O govern sampling and verification of cleanup levels.	If concentrations are less than 50 mg/kg, then Subpart D would be used as relevant and appropriate. Depending on the remedial action alternative, Subparts N and O would be relevant and appropriate.
Solid Waste	RCRA Subtitle D (40 CFR 258)	Potentially Applicable	Applicable to the management and disposal of non-hazardous wastes.	Wastes generated during remedial actions would be disposed at appropriately licensed and permitted facilities.
Air Emissions	Maine Air Pollution Control Law - Classification of Air Quality Control Regions / 38 MSRA 583; 06-096 CMR 114	Potentially Applicable	Establishes air quality regions, the classification of each region, and the ambient air quality and emission standards.	Applicable to alternatives that have the potential to impact ambient air quality standards. If state requirements are more stringent than federal requirements, state requirements take precedence. At the completion of the remedial action, these remedial standards would need to be met.

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ACTION-SPECIFIC ARARs AND TBCs
OPERABLE UNIT 2- FEASIBILITY STUDY REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Requirement	Citation	Status (1)	Synopsis	Evaluation/Action To Be Taken
	~~Maine Air Pollution Control Laws – Maine Emission License Requirements / 38 MSRA 585 and 590; 06-096 CMR 115~~	~~Potentially Applicable~~	~~Establishes that new and modified sources of air emissions are required to demonstrate that emissions do not violate ambient air quality standards. New sources must meet pre-construction monitoring and post-construction monitoring requirements.~~	~~Applicable to alternatives that have the potential to impact ambient air quality standards. If state requirements are more stringent than federal requirements, state requirements take precedence. At the completion of the remedial action, these remedial standards would need to be met.~~
STATE				
Hazardous Waste	Identification of Hazardous Matter 06-096 CMR Part 800 ~~Maine Hazardous Waste Management Rules (06-096 CMR 800-801, 850-854, 857)~~	~~Potentially~~ Applicable	This rule identifies certain substances as hazardous matter, discharges of which are subject to discharge removal, notification, reporting and other requirements under 38 MRSA. §1317, et seq., and rules adopted thereunder. ~~These regulations provide standards for the generation, transportation, treatment, storage, and disposal of hazardous waste. They set forth the state definition and criteria for establishing whether waste materials are hazardous and subject to associated hazardous waste regulations. They also provide standards for detailing groundwater monitoring requirements for hazardous waste facilities.~~	Wastes generated as part of remedial activities would be characterized as hazardous or non-hazardous. If determined to be hazardous waste, then the waste would be managed in accordance with regulatory requirements. ~~These performance standards would be potentially applicable if hazardous waste is generated, transported, treated, disposed, or stored as part of remedial action at OU2.~~

TABLE 2-3

ACTION-SPECIFIC ARARs AND TBCs
OPERABLE UNIT 2- FEASIBILITY STUDY REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Requirement	Citation	Status (1)	Synopsis	Evaluation/Action To Be Taken
	Discharge of Hazardous Matter: Removal and Written Reporting Procedures 06-096 CMR Part 801	Applicable	These regulations set forth the state definition and criteria for establishing whether waste materials are hazardous and subject to associated hazardous waste regulations.	Wastes generated as part of remedial activities would be characterized as hazardous or non-hazardous. If determined to be hazardous waste, then the waste would be managed in accordance with regulatory requirements.
	Identification of Hazardous Wastes 06-096 Part 850	Applicable	These standards establish requirements for determining whether wastes are hazardous based on either characteristic or listing.	Wastes generated as part of remedial activities would be characterized as hazardous or non-hazardous. If determined to be hazardous waste, then the waste would be managed in accordance with regulatory requirements.
	Standards for Generators of Hazardous Waste (38 MRSA 1301 *et seq.*, 06-096 Part 851)	Applicable	These regulations contain requirements for the generators of hazardous waste.	Wastes generated as part of remedial activities would be characterized as hazardous or non-hazardous. If determined to be hazardous waste, then the waste would be managed in accordance with regulatory requirements.
	Hazardous Waste Manifest Requirements 06-096 Part 857	Applicable	This rule establishes requirements for the use of manifests to track the movement of hazardous waste from the point of generation to any intermediate points and finally to its ultimate disposition and establishes related responsibilities and liabilities of generators, transporters and owners and operators of waste facilities for hazardous waste.	Wastes generated as part of remedial activities would be characterized as hazardous or non-hazardous. If determined to be hazardous waste, then the waste would be managed in accordance with regulatory requirements.

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ACTION-SPECIFIC ARARs AND TBCs
OPERABLE UNIT 2- FEASIBILITY STUDY REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Requirement	Citation	Status[1]	Synopsis	Evaluation/Action To Be Taken
Surface Water	Maine Surface Water Toxics Control Program (38 MSRA Parts 420 and 464 - 470; 06-096 CMR Part 530)	~~Potentially~~ Applicable	This rule sets forth the Maine Statewide Water Quality Criteria (SWQC) for toxic pollutants and procedures necessary to control levels of toxic pollutants in surface water. SWQC are set at federal NRWQC levels.	This would be applicable for alternatives that require water management during soil excavation where discharges of treated water to a surface water body may occur. The substantive requirements would be met if any discharges of treated water to a surface water bodies are required. ~~Statewide Water Quality Criteria would be used if surface water monitoring is required to measure the effectiveness of a remedial action at a compliance point based on full mixing, and to ensure that goals are being met.~~
Water Management	Maine Waste Discharge Licenses (38 MRSA 413 *et seq.*) and Waste Discharge Permitting Program (06-096 CMR 520 - 629)	Applicable	These standards regulate the discharge of pollutants from point sources.	These regulations would be applicable to alternatives that require water management during soil excavation and where discharges of treated water to a surface water body may occur. The substantive requirements would be met if any discharges of treated water to surface water bodies are required.
Erosion	Erosion and Sedimentation Control (38 MRSA Part 420-C) ~~and Stormwater Management (38 MRSA Part 420-D; 06-096 CMR Part 500)~~	~~Potentially~~ Applicable	Erosion control measures must be in place before activities such as filling, displacing, or exposing soil or other earthen materials occur. Prior MEDEP approval is required if the disturbed area is in the direct watershed of a body of water most at risk for erosion /or sedimentation.	These ~~controls would be implemented if any of the~~applicable to alternatives that need to address erosion and, sedimentation, ~~and storm water management.~~ Also, aApplicable plans would be coordinated with MEDEP before implementation.

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ACTION-SPECIFIC ARARs AND TBCs
OPERABLE UNIT 2- FEASIBILITY STUDY REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Requirement	Citation	Status[1]	Synopsis	Evaluation/Action To Be Taken
Storm water Management	Storm water Management (38 MRSA Part 420-D; 06-096 CMR Part 500)	Applicable	Storm water management measures must be in place before activities such as filling, displacing, or exposing soil or other earthen material occur.	These controls would be applicable to alternatives that need to address storm water management. Applicable plans would be coordinated with MEDEP before implementation.
~~Air Emissions~~	~~Maine Ambient Air Quality Standards (38 MRSA 584; 06-096 CMR 110)~~	~~Potentially Applicable~~	~~Establishes ambient air quality standards for the protection public health and welfare for particulate matter, sulfur dioxide, carbon monoxide, ozone, hydrocarbons, nitrogen dioxide, lead, and total chromium.~~	~~Applicable to alternatives that have the potential to impact ambient air quality standards. At the completion of the remedial action, these remedial standards would need to be met.~~ ~~These standards would be used if any of the alternatives result in emission of unacceptable levels of airborne particulates to the atmosphere. Lead and total suspended particulate emissions may be of concern at OU2.~~
~~Land Use~~	~~Uniform Environmental Covenants Act (MRSA Title 38, Chapter 31)~~	~~Potentially Applicable~~	~~Specifies required contents of environmental covenants enacted in the State of Maine.~~	~~This act will be relevant and appropriate if a remedial alternative involving LUCs is chosen.~~
Waste Management	Maine Solid Waste Management Regulations (06-096 CMR Parts 400, and 411)	~~Potentially~~ Applicable	Provides standards for generation, transportation, treatment, storage, and disposal of solid and special wastes. Also provides closure and post-closure maintenance standards.	These regulations would be applicable to alternatives where waste is generated. Wastes generated during remedial actions activities would be disposed at appropriately licensed and permitted facilities.

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ACTION-SPECIFIC ARARs AND TBCs
OPERABLE UNIT 2- FEASIBILITY STUDY REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Requirement	Citation	Status[1]	Synopsis	Evaluation/Action To Be Taken
	Additional Standards Applicable to Waste Facilities Located in a Flood Plain (06-096 CMR 854.16)	Relevant and Appropriate	Any facility located or to be located within 300 feet of a 100 year flood zone must be constructed, operated, and maintained to prevent wash-out of any hazardous waste by a 100 year flood or have procedures in place that which will cause the waste to be removed to a location where the waste will not be vulnerable to flood waters and to a location which is authorized to manage hazardous waste safely before flood water can reach the facility.	Waste managed within 300 feet of the 100 year flood zone would be managed in compliance with these standards.
Air Emissions	Visible Emissions Regulation (38 MRSA Part 584; 06-096 CMR Part 101).	TBC	These regulations establish opacity limits for emissions from several categories of air contaminant sources, including general construction activities.	These regulations would be considered for alternatives that have the potential to impact air quality. These standards would be met if any of the alternatives result in emission of particulate matter and fugitive matter to the atmosphere (e.g., dust generation).

~~1. The term "potentially" is used when requirements ("applicable" or "relevant and appropriate") would be invoked only when certain remedial actions are taken.~~

ARAR – Applicable or Relevant and Appropriate Requirement
CFR - Code of Federal Regulations
CMR - Code of Maine Rules
CWA – Clean Water Act
MEDEP - Maine Department of Environmental Protection
MRSA - Maine Revised Statutes Annotated
NPDES – National Pollutant Discharge Elimination System
NRWQC – National Recommended Water Quality Criteria
~~PCB - Polychlorinated biphenyls~~
RCRA - Resource Conservation and Recovery Act
SWQC – Statewide Water Quality Criteria
TBC - To Be Considered
TSD – Treatment, storage, and disposal
USC – United States Code