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U S NAVY RESPONSE TO REGULATOR COMMENTS TO REVISED DRAFT FEASIBILITY STUDY REPORT SOLVENT RELEASE AREA WITH TRANSMITTAL NAS SOUTH WEYMOUTH MA
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May 8, 2012

Project Number G02073

Mr. Brian Helland, RPM
BRAC PMO, Northeast
4911 South Broad Street
Philadelphia, Pennsylvania 19112

Reference: CLEAN Contract No. N62470-08-D-1001
Contract Task Order (CTO) No. WE11

Subject: Responses to Comments - Revised Draft Feasibility Study Report
Solvent Release Area
Former Naval Air Station South Weymouth, Weymouth, Massachusetts

Dear Mr. Helland:

Tetra Tech, Inc. has prepared responses to comments (RTCs) received on the revised draft Feasibility Study (FS) Report for the Solvent Release Area, Former Naval Air Station South Weymouth, Weymouth, Massachusetts. Once the RTCs are reviewed and accepted the draft final FS will be prepared.

On behalf of the Navy, the RTCs on the revised draft FS for the Solvent Release Area, are being provided to the recipients listed below. If you have any questions regarding the RTCs, please contact me at (978) 474-8403.

Very truly yours,

Phoebe A. Call
Project Manager

PAC/lh

Enclosures

c: D. Barney, Navy (w/encl. – 1)
C. Keating, EPA (w/encl. – 3)
D. Chaffin, MassDEP (w/encl. – 1)
P. Steinberg, Mabbett & Associates, Inc. (w/encl. – 1)
P. Sortin, Abington (w/encl. – 1)
M. Brennan, Weymouth (w/encl. – 1)
M. Parsons, Rockland (w/encl. – 1)
Tufts Library, Weymouth (w/encl. – 1)
Public Library, Abington (w/encl. – 1)
Public Library, Rockland (w/encl. – 1)
Public Library, Hingham (w/encl. – 1)
Chief Executive Officer, South Shore Tri-town Development Corp. (w/encl. – 1)
R. Daniels, LNR Property Corp. (w/encl. – 1)
J. Logan, Tetra Tech (w/encl. – 1)
J. Trepanowski, Tetra Tech (w/o encl.)
G. Glenn, Tetra Tech (w/o encl.)
File G02073-3.2 (w/o encl.);
G02073-8.0 (w/encl. - 1 each)

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NAVY RESPONSES TO U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)
COMMENTS DATED MARCH 29, 2012
REVISED DRAFT FEASIBILITY STUDY – SOLVENT RELEASE AREA
FORMER NAVAL AIR STATION (NAS) SOUTH WEYMOUTH, MASSACHUSETTS

The Navy's responses to the EPA comments on the Solvent Release Area Revised Draft Feasibility Study (dated February 2012) are presented below. The EPA comments are presented first (in italics) followed by Navy's responses.

GENERAL COMMENTS

Comment 1. *The comments outlined below are based on the "Revised Summary for the Solvent Release Area (SRA) Feasibility Study" issued by the U.S. Department of Navy on November 7, 2011. This document was prepared as a collaborative effort between the EPA, MADEP, the Local Redevelopment Authority, South Shore Tri-Development Corporation (SSTDC), and the Master Developer, LNR South Shore, LLC, for purposes of expediting the identification and evaluation of potential CERCLA response actions for the SRA site. Specifically, EPA's comments reflect the general consensus of the aforementioned parties with regards to the identification of remedial action objectives (RAOs), preliminary remediation goals (PRGs), and remedial alternatives (i.e., monitoring, engineering controls and land-use controls (LUCs)). Any deviations from the Revised Summary will require further discussions with regards to the assessment of risks and the effectiveness of the remedial alternatives to achieve the site-specific cleanup goals previously identified for the SRA.*

Response: Comment noted.

Comment 2. *EPA believes that additional monitoring locations and additional time-series groundwater quality data is needed to more accurately designate fixed LUC boundaries and better establish both the limits and temporal stability of the plume (e.g. leading edge of the high-concentration plume core and periphery of the dissolved-phase plume). Until the temporal and spatial aspects of the plume are better understood, it is essential that all remedial approaches and alternatives include provisions for augmented monitoring so that the currently understood plume boundaries may be verified or revised as necessary. It is likely that a monitoring program (more robust than that currently discussed in the FS) will be required in both the overburden and bedrock.*

Response: Comment noted. The three alternatives with treatment components (G-3, G-4, G-5) include a pilot treatability study as part of the remedial design phase. That information will be used to determine not only locations of the PRBs and treatment zones but also the extent of the monitoring network. The Navy notes that the time series data collected in 2011 does not show significant differences in the overburden and bedrock plumes when compared to the RI data from 2006-2007 and 2009.

Comment 3. *EPA requested USGS to perform additional geophysical studies during the summer of 2011 in order to collect additional information with which to better constrain site characterization, particularly with respect to the bedrock. The USGS presented preliminary results from these geophysical surveys at the November 2011 BCT meeting. A letter report is expected in the near term which will summarize the results for further BCT review. Although the geophysical data report is not yet available for public dissemination, EPA's tentative assessment of the preliminary results suggests a number of important findings, including the following:*

a. *The potential for N-S striking fractures to extend from the SRA southward into the subsurface in the area beneath the East Mat appears to be supported by the 2-D resistivity data;*
b. *Although the evidence for this feature is not as strong, 2-D resistivity data also appears to suggest the potential for a ENE-WSW striking fracture which may extend from the vicinity of the high concentration source area in bedrock (e.g., CH-108-MW01 vicinity) to the area north of MW10-409D1/D2 and south of Building 112;*

c. *EM (line 1) data show a shallow conductive anomaly near the northwest corner of the open field in the southern portion of the site. While this anomaly may be related to cultural interference, it begs further assessment.*
d. *Few, if any, of the existing bedrock monitoring wells appear to be ideally located laterally with respect to 2-D resistivity anomalies.*

Response: The Navy will review the USGS information once a report is made available.

Comment 4. *The down-gradient limits of the plume near its currently defined southwestern limits are complicated by the presence of engineered drainage. The role of these structures in plume migration needs to be better understood and factored into the remedial approach for SRA.*

Response: Comment noted. The role of these structures will be accounted for during the remedial design phase development of the long term monitoring program which is a component of several remedial approaches.

Comment 5. *If DNAPL is present in the source area (which is likely based on the existing PCE concentrations in groundwater), then the modeling performed for this feasibility study significantly underestimates the time required to achieve the remedial goals (the source would be constant rather than decaying). Consequently, the true life cycle costs, not the 30-year costs or even the modeled life cycle costs, will be significantly greater. This consideration makes the option of aggressive source control very favorable economically.*

Response: Comment noted.

Comment 6. *The evaluation of the effectiveness of each of the treatment technologies focuses primarily on the ability of the technology to treat chlorinated volatile organic compounds (CVOCs). Given that groundwater contaminants of concern also include pentachlorophenol, 3,3-dichlorobenzidine, arsenic, and barium, more discussion should be provided with respect to how the risks associated with exposure to these other contaminants will be addressed by the remedial alternatives being proposed.*

Response: The Section 2.2.1 discussion of groundwater COCs will be expanded to support the focus on options to treat the CVOCs and address the contribution to site risk for the four COCs mentioned in the comment. Note that as discussed in the RI, pentachlorophenol is present at a concentration greater than its MCL in only one well, which is a deep bedrock well. Similarly, 3,3'-dichlorobenzidine is present in only one well, which is in the shallow bedrock. Barium is present at a concentration greater than its MCL in only one well, which is in the deep bedrock. The occurrence and risk associated with these three COCs is low. Arsenic was detected in most wells, but all concentrations were less than its MCL. Please see the RI for the HHRA and associated risk calculations.

As discussed in the RI's HHRA, the risk associated with these compounds is via ingestion of groundwater. Since site groundwater will not be used for potable and irrigation purposes, the FS addresses the risk from exposure to these COCs to a construction worker via ingestion, not dermal contact. The PCE risk via ingestion of groundwater is an order of magnitude greater than the risk associated with these four COCs. Active treatment of these COCs does not appear to be necessary and was not discussed.

Comment 7. *Alternatives which rely upon mulch PRBs should be expected to drive the aquifer anoxic. In this geologic environment, this may result in large increases in dissolved manganese and other redox-sensitive metals in the aquifer and accumulation of manganese and other metals in stream sediments and surface waters of the EMD and downstream drainage system. Risk assessments and remedial alternatives need to be revised to address these likely developments.*

Response: The monitoring component of each alternative (both groundwater and surface water) will provide data on any metals mobilization and allow for an assessment of a need for injection of additional or different electron donor substrate. In addition, long-term monitoring of the sediment will be added to

evaluate the potential for the accumulation of iron and manganese due to the reducing conditions created by the PRBs. Details on the monitoring program, including locations, frequency, etc., will be determined during the remedial design phase.

Comment 8. *Additional performance data and perhaps site-specific pilot testing are needed to determine the hydraulic viability of the mulch PRBs called for in a number of the remedial alternatives. Please provide case-study information which demonstrates the sustained hydraulic performance of mulch walls over time frames necessary for these remedial alternatives. The regular and periodic need to re-inject ED into the mulch PRBs is further cause for concern. What specific "ED" will be used? What will be its effects on permeability of the PRB? The suggestion that oil-based substances are being considered suggests the potential for loss of permeability following injections. Additionally, the potential for the mulch to self-plug with precipitates formed from redox-sensitive metals or other compounds needs to be assessed in detail. Please provide any available performance data on these technologies which speak to permeability and longevity, particularly ability to sustain permeability under site-specific conditions. If the mulch PRB cannot sustain necessary permeability, ground water will simply flow around and/or beneath the wall, and treatment will be ineffective. Please clarify.*

Response: As noted in the descriptions of Alternatives G-3, G-4, and G-5, a pilot treatability study will be performed as part of the remedial design. Details on design of the PRBs, substrates, maintenance, etc. will be determined during the design phase. The FS is intended to provide a conceptual description of remedial alternatives, specifics are included at the remedial design phase.

The Interstate Technology & Regulatory Council (ITRC) has a number of resources available to address the questions in the comment about PRBs. Please see: http://www.itrcweb.org/prb/; and http://www.itrcweb.org/Documents/PRB-5-1.pdf. The ITRC PRB-5-1 document is a June 2011 PRB technology update which includes 13 case studies and an extensive reference list (23 pages).

Comment 9. *Additional information is needed to provide assurance that the enhanced bioremediation scheme called for in Alternative G-5 to treat overburden and bedrock hotspots is viable. While the report appropriately acknowledges the uncertainties in effectively injecting and distributing the ED, additional uncertainties exist regarding the general effectiveness of this approach in bedrock. Please provide case-study information which demonstrates the use of this technology in achieving clean-up goals, particularly in bedrock. Please indicate the particular clean-up goals achieved time-frames, nature of the geologic environment, and whether the process achieved site close-out.*

Response: Electron donors, such as sodium lactate, emulsified oil and Hydrogen Releasing Compound (HRC), have been applied at many sites to stimulate the bioremediation of CVOCs in bedrock aquifers. EPA's Contaminated Site Clean-up Information website lists several successful case studies (http://www.cluin.org/contaminantfocus/default.focus/sec/Fractured_Rock/cat/Remediation/), such as a site at the former Naval Surface Warfare Center (NSWC) in White Oak, MD (http://www.cluin.org/products/fracrock/sitedtl.cfm?mid=302), where several rounds of vegetable oil emulsion injections had been performed to treat the PCE contamination in the bedrock aquifer. EPA's Technology News and Trends newsletter in December 2009 (http://www.clu-in.org/download/newsltrs/tnandt1209.pdf) reported the most recent EOS injection following pneumatic fracturing at this site as a successful case study for its achievement in distribution of the emulsified oil and stimulation of sequential dechlorination of PCE. Another good example is the Naval Air Warfare Center (NAWC) Research Site, West Trenton, NJ, where numerous studies had been conducted by US Geological Survey on characterization and remediation of chlorinated solvents in fractured-sedimentary rock (http://nj.usgs.gov/nawc/index.htm), including a recent study to combine biostimulation with bioaugmentation to increase the biodegradation rate of cis-1,2-DCE. However, most of these sites have not achieved site closure; therefore, the particular clean-up goals achieved time-frames are not available for comparison.

Comment 10. *The well and/or concentration labels on several of the figures are obscured by isoconcentration lines or other features. Please revise the figures, where necessary, so that it is easier to read the data labels.*

Response: The Section 4 figures will be revised to better show the pertinent details and printed at C-size for the draft final FS.

Comment 11. *To the extent the new data are available that would useful in evaluating the plume, please provide updated cross-section figures for groundwater contamination in overburden and bedrock groundwater.*

Response: Incorporating the 2011 groundwater analytical data into the cross-sections would not significantly alter the inferred PCE iso-contours. Therefore, the Navy believes that updating the cross sections is not necessary at this time. Please also see the Response to Specific Comment #15.

Comment 12. *Please revise the report based on the new toxicity values for TCE and PCE. Use the updated toxicity factors to revise any of the Johnson and Ettinger modeling that was conducted. For vapor intrusion evaluation, EPA recommends use of the newly released Vapor Intrusion Screening Level (VISL) calculator and its constituent parameters (particularly the updated risk-based screening levels for indoor air, not yet revised on the RSL tables, as well as the updated intermedia attenuation factors), available at:*

(http://www.epa.gov/oswer/vaporintrusion/guidance.html).

Since the new toxicity values indicate lower toxicity for PCE and higher toxicity for TCE, it will be necessary to: 1) revise the COC selection discussion to justify the exclusion of TCE for vapor intrusion evaluation, 2) revise the PRGs for PCE and TCE (e.g. Table 2-3, appendix B, associated figures with LUC boundaries), and 3) revise the discussion concerning the remedial alternatives as appropriate based on the changes.

Response: The COCs for the FS were determined in the RI, finalized in August 2010; they will not be changed nor will the vapor intrusion evaluation be revised based on updates to EPA's toxicity values. For PRG calculations, the most current values were used: the toxicity values for TCE were updated in September 2011 and the toxicity values for PCE were updated in February 2012. Note that the LUC boundaries shown on the Section 4 figures are conceptual and based on the RI data; details will be determined during the remedial design for the Site.

PAGE-SPECIFIC COMMENTS

Comment 1. *Page vi - Please update the acronym list to include missing acronyms, such as TTZ.*

Response: The suggested revisions will be made.

Comment 2. *Page 1-1, Section 1.1.1, ¶ 3 – Please amend the second sentence to state, "Following a 30-day public comment period, the Navy* ***and EPA*** *will select the remedial alternative(s),* ***with concurrence from*** *the Massachusetts Department of Environmental Protection (MassDEP)."*

Response: The suggested change will be made.

Comment 3. *Page 1-5, Section 1.2.3 - Please check the first sentence under AOC 35. The pistol range is located in the southwestern corner of the Site.*

Response: The sentence will be revised as follows: "…2 acres of land in the southern portion of the Site…"

Comment 4. *Page 1-9, Section 1.3.3 - Please verify the dates included in the last (partial) sentence at the bottom of the page*

Response: The sentence will be revised as follows: "Four synoptic groundwater level measurement rounds completed in November 2006, December 2006, April 2007 and November 2009…"

Comment 5. *Page 1-10, Section 1.3.4 - Please change the references in this section, and throughout the document as necessary, from Region 9 PRGs to Regional Screening Levels.*

Response: Section 1.3.4 summarizes the nature and extent discussion from the RI. As noted in the RI, the Region 9 PRGs were used in the nature and extent evaluation since the RI data were evaluated prior to the use of the RSLs. The risk assessments in the RI however, were completed using the EPA RSLs.

Comment 6. *Page 1-11, Section 1.3.4, ¶ 2 - The groundwater sampling data provided in Appendix H do not support the conclusion that PCE plume concentrations in the overburden are "consistent or decreasing". Of particular concern is the increasing concentration of PCE in SRA-MW-304, which is located at the current southeastern limit of the PCE plume. A tenfold increase in concentrations in this well between 2004 and the present suggests the plume may still be migrating in this direction*

Response: Comment noted. The text acknowledges that the PCE concentration in SRA-MW-304 and CH108-MW01 are exceptions to the consistent or decreasing trends noted at the other locations. SRA-MW-304 will be recommended for inclusion in the remedial alternative monitoring to monitor what is occurring at the eastern edge of the plume.

Comment 7. *Page 1-11, Section 1.3.4, ¶ 3 - While the description of PCE concentration trends in bedrock groundwater is generally accurate, it should be noted that the conclusion that there has not been a "significant shift" in the bedrock plume since 2004 could be, in part, driven by the lack of sampling data in the bedrock to the east of the plume.*

Response: Comment noted.

Comment 8. *Page 1-12, Section 1.3.5, ¶ 3 - Regarding the second bullet, the presence of elevated metals concentrations in groundwater can reasonably be attributed to the release of chlorinated hydrocarbons at the site which impacted the groundwater geochemistry. This scenario needs to be acknowledged in the appropriate section of the FS.*

Response: Agreed. The FS will note the potential association of elevated metals in groundwater with CVOC contamination in the description of alternatives. It is expected that these metals will be attenuated through natural-occurring processes when the CVOCs are degraded and geochemical condition returns to relatively oxic in the subsurface that favors the adsorption and/or precipitation of metal contaminants. The FS alternatives include a monitoring component to evaluate changes in geochemistry during and after the treatment phase of the selected remedy so that any potential migration or attenuation of metal contaminants will be monitored.

Comment 9. *Page 1-13, Section 1.3.6.1, ¶ 2 – Please amend the sentence to state, "Potential unacceptable risks were identified for future residents (adult and child), primarily from use of groundwater as drinking water* ***and in the form of vapor intrusion into buildings*** *and construction workers from ingestion, dermal exposure and inhalation of vapors in narrow deep trenches.*

Response: The suggested revision will be made.

Comment 10. *Page 1-13, Section 1.3.6.1, ¶ 3 – Please delete the first sentence and replace it with, "The major contributor to risk is PCE in groundwater. In addition to use for drinking water purposes, an evaluation of potential risks associated with use of groundwater for irrigation indicated a potential risk to future residents via the dermal exposure pathway (adult only) and the vegetable ingestion exposure pathway (adult and child)." (Please note that because the SRA is not located within a potentially aquifer and extraction of groundwater for drinking water and irrigation purposes have been excluded as potential "beneficial uses" (per the 11/7/11, Revised Summary), the remediation goals for the FS will be to prevent*

further migration of contaminants in the aquifer (i.e., prevent further contamination of groundwater or other media via vapor intrusion into buildings, sediments and surface water or wetlands).

Response: The suggested change will be made. Note that the RAOs incorporated into the FS per the November 2011 Summary pertain to groundwater, vapor intrusion, and surface water only.

Comment 11. *Page 1-14, Section 1.3.6.1, ¶ 2 – EPA does not agree that the site conditions prevent the construction of a trench or excavation that would allow construction worker exposure to PCE. (See also Navy's November 8, 2011 letter to EPA presenting the revised summary for the solvent release area FS which includes such a scenario.) Please delete this sentence.*

Response: It appears that EPA has misinterpreted the sentence. The sentence pertains specifically to the type of trench used in the HHRA construction worker exposure model, e.g., 8 ft. x 4 ft. x 8 ft. Since the groundwater is at a depth of 1 – 2 ft. bgs in the wetland where the source area is located, the sentence acknowledges that it would not be possible to construct the type of trench modeled in the HHRA in that particular area.

Comment 12. *Page 1-14, Section 1.3.6.1, ¶ 3 – Please revise the third sentence to state, "Therefore, as summarized above, the potential unacceptable risks associated with the use of groundwater for potable (i.e. drinking water) and irrigation are not applicable for the FS." (On the other hand, if use of groundwater for irrigation purposes is a potential "beneficial use", then the FS must develop and evaluate remediation goals for this exposure pathway.)*

Response: This paragraph will be deleted. A discussion of the exposures evaluated in the FS, consistent with the November 2011 Summary will be added to Section 2. Please see the Response to MassDEP Comment #1.

Comment 13. *Page 1-15, Section 1.3.6.3, ¶ 1 –Please add the following text to the end of the last sentence, "… with volatile organics,* ***and exposure of building occupants to volatile organic compounds resulting from vapor intrusion."***

Response: The suggested change will be made.

Comment 14. *Figure 1-4 – Please check the scale bar in the insert map.*

Response: The scale bar in the insert map will be corrected.

Comment 15. *Figures 1-4 & 1-5 - These figures should be updated to include the 2011 groundwater sampling data to match Figures 1 and 4, respectively, in Appendix H. Also, to the extent that they provide new data, updated cross sections should be developed to depict the CVOC impact in overburden and bedrock groundwater. Also, consider separating shallow from deep bedrock in separate figures.*

Response: Figures 1 and 4 from Appendix H will be added as Figures 1-6 and 1-7, respectively, in Section 1. Incorporating the 2011 groundwater analytical data into the cross-sections would not significantly alter the inferred PCE iso-contours. Therefore, the Navy believes that updating the cross sections is not necessary at this time. The Navy did consider separating shallow from deep bedrock PCE iso-concentrations in separate figures; however the Navy determined that the current representation of the plan-view of the shallow and deep bedrock PCE iso-concentrations on the same figure, combined with the PCE iso-concentrations depicted on the numerous cross sections are more than adequate for RI/FS purposes.

Comment 16. *Figure 1-6 - The buildings/structures on this figure in the RecD and MUVD areas differ from those in other figures. Please correct or clarify why they differ.*

Response: The markings are artifacts from old GIS/CADD layers and will be removed as appropriate.

Comment 17. *Page 2-1, Section 2.0 - The discussion in this section states that there are no current excess risks due to sediment contamination; however, it is not clear that sediment would not become more contaminated in the future due to migration of groundwater contamination. At a minimum, all alternatives need to include a long-term monitoring component for sediment to verify that sediment does not become a medium of concern.*

Response: As noted in the response to General Comment No. 7, long-term monitoring of sediment in the EMD will be added to evaluate the potential for the accumulation of iron and manganese due to the reducing conditions created by the PRBs. Iron and manganese in the groundwater will oxidize in the EMD and may precipitate in the ditch sediment. The sediment monitoring data would be compared to the Base background concentrations (24,000 mg/kg for iron and 3,690 mg/kg for manganese). Ditch sediment monitoring will not include VOCs because VOCs are poorly sorbed and are subject to volatilization and/or biological degradation in the ditch.

Comment 18. *Page 2-2, Section 2.2.1, ¶ 1 – As reasons previously discussed, please revise the text to state, " As noted in Section 1, groundwater at the Site is not classified by MassDEP as a medium- or high-yield aquifer and use of Site groundwater for drinking or irrigation purposes are not considered reasonable, foreseeable future uses, the potential unacceptable risks associated with the use of groundwater via these exposure pathways are not applicable for the FS." (On the other hand, if use of groundwater for irrigation purposes is a potential "beneficial use", then the FS must develop and evaluate remediation goals for this exposure pathway.)*

Response: The paragraph will be deleted since the discussion of reasonable foreseeable future groundwater uses will be added to Section 2 as discussed in the Response to MassDEP Comment #1. The Section 2.2.1 text on page 2-1 will be revised for consistency.

Comment 19. *Page 2-2, Section 2.3.1 – Please clarify the second RAO 2 by accounting for all "future building" exposure scenarios (i.e., residential, commercial, or recreational occupants).*

Response: The RAOs were developed cooperatively between Navy, EPA, MassDEP, SSTTDC and LNR. All parties concurred on the precise wording of the four RAOs in late 2011 prior to the closing. Therefore the RAOs will not be revised.

Comment 20. *Page 2-6, Section 2.4.1.1, ¶ 2 – Please revised the text in the first sentence to state, "Risk-based PRGs establish cleanup goals for remedial actions to reduce concentrations of COCs in site media and mitigate unacceptable risks to human health and the environment."*

Response: The suggested change will be made.

Comment 21. *Page 2-6, Section 2.4.1.1, ¶ 2 – In addition to groundwater, please describe the methodology used to derive PRGs for surface water, vapor intrusion and future construction worker (and irrigation, if deemed relevant).*

Response: The text of the referenced paragraph will be revised as follows: "…PRGs were derived for the COCs identified in Site groundwater and surface water. The methodology used to derive PRGs for these media and the selected exposure pathways is described below."

Comment 22. *Page 2-6, Section 2.4.1.1, ¶ 3 – In accordance with the aforementioned November 2011, "Revised Summary for the Solvent Release Area (SRA) Feasibility Study," please add the following exposure scenarios to this section:*

- *Future receptors under the future land uses for the various areas of the site, I.e., recreation, institutional use and construction of buildings, roads and utilities in the RecD area; and, open space, recreation and roads in the OS-W zone. (If the plume continues to migrate to the southwest, residential receptors in the MUVD may also be at risk from vapor intrusion.)*
- *Recreation exposure to surface water.*

Response: The text of the referenced paragraph will be revised to include the four exposure pathways included in the November 2011 FS Summary.

Comment 23. *Page 2-6, Section 2.4.1.2, ¶ 1 – Please replace the first and second sentences with the following, "Because the groundwater at the site is a low-yield aquifer (and extraction of groundwater for drinking water and irrigation purposes have been excluded as potential "beneficial uses" (per the 11/7/11, Revised Summary)), the groundwater is not a drinking water source. As such, drinking water criteria, such as MCLs and Maximum Contaminant Level Goals (MCLGs) are not considered as potential PRGs and remediation goals will be to prevent further migration of contaminants in the aquifer (i.e., prevent further contamination of groundwater or other media via irrigation, vapor intrusion into buildings, sediments and surface water or wetlands." The fact that an aquifer is not a medium- or high-yield aquifer does not prevent groundwater from being used as a source of potable or irrigation water and is therefore not an effective risk mitigation measure. A permanent LUC will be needed.*

Response: Comment noted. However, the referenced section discusses the development of PRGs. Remedial Action Objectives are developed in the preceding section, and these RAOs are used to establish the PRGs. Thus, the text will be revised as follows: "Because the Site is mapped by MassGIS as a low-yield aquifer and MassDEP has assigned category GW-3 to site groundwater, use of the groundwater for drinking water is not considered a reasonable foreseeable future use. As noted previously extraction of groundwater for drinking water and irrigation purposes have been excluded as potential 'beneficial uses.' As such, drinking water criteria, such as MCLs and Maximum Contaminant Level Goals (MCLGs) are not considered as potential PRGs."

The balance of the suggested text pertains to RAOs, which is not appropriate to this section and does not need to be included.

Comment 24. *Page 2-7, Section 2.4.1.4 – Table 2-3 should be revised to reflect each of the exposure scenarios previously discussed in comment above (i.e., groundwater, surface water, vapor intrusion, and future construction worker). Also, per the Navy's March 21, 2011 response to EPA comments (#25) for the August 2010 FS, where are the PRGs for vapor intrusion into future building? Please add Appendix B from the August 2010 draft FS. It included a discussion of how VI PRGs would be used as part of the LUC RD to identify areas were special building design and construction methods must be used to prevent VI and should remain part of the SRA FS.*

Response: The text and table will be clarified and revised as appropriate. As discussed in responses to other comments, a VI PRG will be calculated for the VI exposure in future buildings on the recreation zoned portion of the Site south of the EMD. The existing VI PRG will be applied to VI exposure in future buildings in the open space zoned portion of the Site north of the EMD. Both sets of VI PRG calculations, e.g. VI exposure in future buildings constructed in the open space and recreation zoned portions of the Site, will be included in Appendix B. All of the PRG calculations were revised for this version of the FS, and the previous content of Appendix B is obsolete. Note that the previous version of Appendix B only included calculation sheets; no discussion was included.

Comment 25. *Page 2-9, Section 2.4.1.4, ¶ 2 – Please amend the second bullet as follows: "Limited Action – Monitored Natural Attenuation, Engineering and Land-Use Controls.*

Response: It appears that the comment is referring to Section 2.5.1, not 2.4.1.4. Section 2.5 describes the GRAs, not specific remedial alternatives. No change will be made.

Comment 26. *Page. 2-10, Section 2.6.2 – Please change the table reference in this section from Table 2-6 to Table 2-4.*

Response: The table reference will be corrected.

Comment 27. *Table 2-1 - Please change the title of this table to include TBCs.*

Response: The table title will be changed as suggested.

Comment 28. *Table 2-3*

- *In addition to arsenic, please add PRGs for other common redox sensitive metals (i.e., manganese and iron) (to respond to potential bioremediation-related issues).*
- *Please add the following columns to the table:*
    - *-Selection Basis*
    - *-Risk Associated with Selection (this is to ensure consideration of cumulativeVOC risks)*
- *Please add a bullet to indicate that MCLs were not evaluated because the groundwater at the site is a low-yield aquifer and extraction of groundwater for drinking water and irrigation purposes have been excluded as potential "beneficial uses" (e.g., implementation of permanent LUCs).*

Response: Table 2-3 indicates the PRGs calculated for Site COCs. Manganese and iron are not site COCs and thus will not be added to the table. A new table will be added that will provide the additional information requested in the comment, e.g. selection basis for the PRG and associated risk, similar to the table in the Building 82 FS. A footnote will be included in the new table that explains why MCLs are not evaluated for groundwater.

Comment 29. *Table 2-4 – Please add "Based on data collected as of (insert date)" to the table.*

Response: A footnote will be added to the table with the suggested text.

Comment 30. *Page 3-3, Section 3.1 - Per the Navy's March 21, 2011 response to EPA comments (#32) on the August 2010 FS, please remove the row entitled "Removal."*

Response: The suggested change will be made.

Comment 31. *Page 3-8, Section 3.2.3 – Please see preceding comment #30.*

Response: The suggested change will be made.

Comment 32. *Page 3-12, Section 3.2.4.1, Conclusion, 2nd sentence – Section 3.2.4.1 in the August 2010 Draft FS states that "Injection of a substrate into overburden is not anticipated" and "Injection of a substrate into the bedrock is likely to be effective." These statements seem to contradict the text in the current document. Please clarify.*

Response: The text in the revised draft FS is correct.

Comment 33. *Page 3-13, Section 3.2.4.2, Last ¶ - The second part of the first sentence states, "… but may cause some negative impacts to the site such as significant disturbance to the wetland." This language did not appear in the August 2010 draft FS. Please elaborate on the source of the information/data used to support this new finding.*

Response: The referenced text was added based on the potential for injection of oxidizers in the higher concentration source area which is also located in a delineated wetland. The equipment used for installation of injection points in this area would disturb the wetland and wetland restoration would then be required. Alternatively, soil mixing equipment could be used for adding the oxidizers; this equipment would also disturb the wetland and wetland restoration would then be required.

Comment 34. *Page 3-15, Section 3.2.4.3, Implementability - This section should also note that the PRB would not be practical for treating bedrock groundwater.*

Response: The second paragraph under 'Implementability' makes this point.

Comment 35. *Page 3-16, Section 3.2.4.3, ¶ 1 – Although ZVI PRBs were not retained because of the need for replacement in 15 to 20 years, what is the frequency (and overall costs) of electron donor substrate injections?*

Response: The frequency of electron donor replenishment in mulch PRBs is approximately every 5 years. This information will be noted in this section. Mulch PRB replenishment is discussed in Section 4. The overall costs are not included in Section 3, but the estimated costs for the PRBs and electron donor replacement can be found in the cost estimates in Section 4 and Appendix G.

Comment 36. *Page 3-17, Section 3.3 – See comment #25 above.*

Response: As noted in the response to Comment #25, Section 2.5 describes the GRAs, not specific remedial alternatives. No change will be made.

Comment 37. *Page 4-9, Section 4.2.2.1, Component 1, ¶ 1 – Please add the following language to the end of the paragraph, "Monitoring wells will be located to monitor groundwater both north and south of the EMD as well as groundwater flowing into an active treatment area such as a PRB. The final LTM well locations and surface water locations in the EMD will be determined during the RD phase for the selected remedy.*

Response: The following text will be added to the referenced paragraph: "Monitoring wells will be located to monitor groundwater both north and south of the EMD. The final LTM well locations and surface water locations in the EMD will be determined during the RD phase for the selected remedy." Please note that Alternative G-2 does not include a PRB component.

Comment 38. *Page 4-9, Section 4.2.2.1, Component 2, ¶ 1 – According to the August 2010 draft FS, the temporary fence would be installed around the "western end" of the EMD. Please clarify. In addition, please add the following text to the end of the last sentence, "(i.e., the remedy is operating properly and successfully)."*

Response: The western end of the EMD is where the potential recreational user risk noted in the text of the revised draft FS is greater than 1×10^{-5}. The reference text will be added to the end of the last sentence of the paragraph.

Comment 39. *Page 4-9, Section 4.2.2.1, Component 3, ¶ 2 – Please amend the first sentence to read, "The permanent LUCs would prohibit all uses of groundwater at the SRA site including, but not limited to, drinking water, irrigation, dewatering, heating/cooling purposes, and industrial processes.*

Response: The suggested text is not consistent with the permanent LUCs agreed to by SSTTDC, LNR, EPA, MassDEP and the Navy as documented in the November 2011 FS Summary. The text will be revised as follows:

"Because the SRA Site is not located within a potentially productive aquifer and SSTTDC and LNR have indicated that the potable and irrigation water needs for site redevelopment can be provided by sources other than the groundwater under the Site, future use of the Site groundwater for potable or irrigation uses are not exposure scenarios evaluated in the FS. Therefore, a permanent LUC that prevents the use of groundwater at the SRA Site for potable or irrigation purposes would be used to prevent exposure of residents to VOCs in groundwater at concentrations that pose unacceptable risk (SSTTDC/LNR, 2011). The approximate boundary of the permanent LUC area is shown on the figures that depict each alternative, for example Figure 4-1.

PRGs for the vapor intrusion and construction worker pathways would be used to establish specific LUC boundaries as shown on Figure 4-1 (for example). Based on the low contaminant concentrations in shallow overburden groundwater south of the EMD, LUCs to prevent construction worker or vapor intrusion exposures are not being considered south of the EMD. Therefore, it is anticipated that the EMD will be established as the LUC compliance boundary and no LUCs (other than the permanent LUC

prohibiting use of groundwater for drinking water or irrigation) would be imposed downgradient of the EMD (SSTTDC/LNR, 2011). SSTTDC and LNR have indicated that the interim LUCs listed below would be consistent with the proposed future uses of the area upgradient of the EMD (SSTTDC/LNR, 2011).

- A LUC requiring prior EPA and MassDEP approval of construction dewatering plans before excavation activities could be conducted, until PRGs are achieved.
- A LUC specifying health and safety procedures to be used by construction workers to prevent unacceptable exposure risks based upon risk-based values, until PRGs are achieved.

In all cases, the interim LUCs listed above would be narrowly tailored to prevent specific, identified risks and exposure scenarios identified in the HHRA and applicable to this FS, and would be limited in both location and scope so as not to unreasonably burden or prohibit reasonably foreseeable uses anticipated by the Reuse Plan."

Comment 40. *Page 4-10, Section 4.2.2.2, Overall Protection of Human Health and the Environment, ¶ 2 - The second sentence should be revised to state that monitoring will be used to verify the continued protectiveness of the remedy since monitoring in and of itself does not provide protection from potential risks. The same comment applies to all other alternatives except the No Action Alternative.*

Response: The referenced sentence will be revised as follows: "Monitoring will be used to verify the continued protectiveness of the remedy by evaluating the change in contaminant concentrations…" This change will also be made to the appropriate text for Alternatives G-3, G-4, and G-5.

Comment 41. *Page 4-12, Section 4.2.2.2, Cost - The net present worth analysis for Alternative G-2 presented here and in Appendix G is limited to the 30-year period of analysis although the anticipated life cycle of the alternative is 116 years according to Appendix F. Please add text to acknowledge that while the cost basis used for the FS is 30 years, the actual anticipated cost will be greater based on the need to perform annual monitoring over the entire life of the remedy. A similar text edit should be made for all the alternatives.*

Response: The following text will be added to this section and the cost discussion for Alternatives G-3. G-4, and G-5: "Note that while the cost basis used in this FS is 30 years, based on the anticipated life cycle of the alternative (see Appendix F) the actual anticipated cost and net present worth will be greater since monitoring will continue throughout the entire life of the remedy."

Comment 42. *Page 4-15, Section 4.2.3.2, Reduction in the Toxicity, Mobility, or Volume Through Treatment - While the generation of PCE daughter products is mentioned here, the suggestion is that they will degrade over time without impacting the toxicity of the plume. Given the toxicity of vinyl chloride and its persistence in the environment, the ability of the mulch PRB(s) to achieve complete degradation of PCE should be addressed here or in the long-term effectiveness section of the analysis.*

Response: The last sentence of the 2nd paragraph under 'Long-Term Effectiveness and Permanence' will be revised as follows: "Monitoring the progress of the mulch RPB's treatment would be an effective means to evaluate the progress of remediation, monitor changes in contaminant composition from biological degradation (such as vinyl chloride concentrations), and verify that no migration of COCs is occurring."

Comment 43. *Page 4-17, Section 4.2.4.1, Component 1: Overburden Mulch PRBs, ¶ 4 - : Although disturbance of wetlands is likely to be avoided, this paragraph should at least mention that construction of the northernmost PRB may involve additional controls due to the fact that work will need to be conducted within a wetland buffer zone.*

Response:: The following sentence will be added to the referenced paragraph: "If a PRB is constructed in a wetland or wetland buffer zone, other construction techniques may be required."

Comment 44. *Page 4-19, Section 4.2.4.2, Long-Term Effectiveness:- The evaluation of this alternative would be improved if an estimate of the time until the vapor intrusion LUC can be lifted was provided. This would allow an evaluation of the additional benefit provided by the second PRB.*

Response: Comment noted. However, this estimate cannot be made with any certainty at this time.

Comment 45. *Page 4-19, Section 4.2.4.2, Short Term Effectiveness:- There may be short-term impacts to the environment from the implementation of this alternative due to the proximity of the northern PRB to on-site wetlands.*

Response: Comment noted.

Comment 46. *Page 4-20, Section 4.2.4.2, Implementability - The administrative feasibility evaluation should include a discussion of any permitting requirements resulting from installing the northern PRB in a wetland buffer zone, understanding that the Navy need only comply with the substantive portions of these requirements and a permit is not required due to the site's Superfund status.*

Response: Comment noted. However, as stated in the description of Component 1 on page 4-17, the second PRB would be located south of the wetland to avoid wetland impacts. The following sentence will be added to the Implementability discussion: "Construction of a PRB in a wetland or wetland buffer zone would comply with the applicable requirements of the MassDEP regulations and SSTTDC Wetlands Protection Rules and Regulations for NAS South Weymouth."

Comment 47. *Page 4-24, Section 4.2.5., Reduction in the Toxicity, Mobility, or Volume Through Treatment - While the generation of PCE daughter products is mentioned here, the suggestion is that they will degrade over time without impacting the toxicity of the plume. Given the toxicity of vinyl chloride and its persistence in the environment, the ability of in situ enhanced bioremediation and the mulch PRB to achieve complete degradation of PCE should be addressed here or in the long-term effectiveness section of the analysis.*

Response: The 3rd paragraph under 'Long-Term Effectiveness and Permanence' will be revised as follows: "Monitoring the progress …mulch PRB would be an effective means to evaluate the progress of remediation, monitor changes in contaminant composition from biological degradation (such as vinyl chloride concentrations), and verify that no migration of COCs is occurring."

Comment 48. *Page 4-26, Section 4.2.5.2, Implementability – See comment #46 above.*

Response: The following sentence will be added to the Implementability discussion: "Construction of a PRB in a wetland or wetland buffer zone would comply with the applicable requirements of the SSTTDC Wetlands Protection Rules and Regulations for NAS South Weymouth."

Comment 49. *Table 4-1*
Please change the title of this table to include TBCs. The same comment applies to the other chemical-specific tables in this section.
This table states there are no State chemical-specific ARARs, but Table 2-1 provides MCP groundwater classifications and Upper Concentration Limits as chemical-specific ARARs. Please correct the tables for consistency.

Response: 'TBCs' will be added to the title of all chemical-specific ARARs tables as suggested. The state entries in Table 2-1 will be added to Table 4-1 and revised in the context of the No Action alternative.

Comment 50. *Figures 4-1 to 4-4*
None of these figures includes the August 2011 analytical data. The most recent data should be presented for these figures that depict the alternatives.

It is difficult to tell because of the scale of the drawing, but please verify that the fencing will be installed on both sides of the EMD and not just on one side of the ditch.

Response: The August 2011 analytical data will be added to Figures 4-1 to 4-4. A note will be added to each figure to indicate that the engineering controls, e.g. fencing, will be installed on both sides of the EMD.

Comment 51. *Page 5-1, Section 5.1.1, Overall Protection of Human Health and the Environment, ¶ 4 - It should also be noted in this paragraph that Alternative G-5 would be more protective than Alternatives G-3 and G-4 since Alternative G-5 includes the active treatment of groundwater in bedrock.*

Response: The 3rd sentence of the referenced paragraph will be revised as follows: "Alternative G-5 would provide the greatest protection because it treats the high-PCE concentration source areas in overburden and bedrock with enhanced bioremediation and part of the plume with PRBs."

Comment 52. *Page 5-2, Section 5.1.3, Long-Term Effectiveness and Permanence, ¶ 1 – Please see preceding comment #51.*

Response: The following sentence will be added to the referenced paragraph: "Alternative G-5 would provide the greatest long-term effectiveness and permanence since both overburden and bedrock groundwater will be treated."

Comment 53. *Page 5-2, Section 5.1.4, Reduction in Toxicity, Mobility, and Volume Through Treatment, ¶ 4 - Alternative G-2 should be added to this sentence.*

Response: Alternative G-2 is described in the last sentence of the first paragraph. The information will be moved to the fourth paragraph.

Comment 54. *Page 5-5, Section 5.1.6, Implementability, ¶ 3 - It is stated that the addition of the second PRB will enable the vapor intrusion restriction to be lifted as soon as the PRGs are achieved within the plume upgradient of the EMD. It would be useful for the comparison of Alternatives G-3 and G-4 to provide an estimate of the time frame for achieving PRGs downgradient from the northern PRB so that the additional value of the second PRB can be evaluated in context with the other criteria such as implementability and cost.*

Response: Comment noted. However, an estimate of time frames to compare the two alternatives cannot be made at this time.

Comment 55. *Page 5-5, Section 5.1.7 - Please edit the text to acknowledge that the net present worth costs for the purposes of this FS are based on a 30-year analysis; however, the true cost for the alternatives will be greater because the life cycle for the alternatives far exceeds 30 years.*

Response: The following text will be added to this section: "Note that while the cost basis used in this FS is 30 years, based on the anticipated life cycle of the alternative (see Appendix F) the actual anticipated cost and net present worth will be greater since monitoring will continue throughout the entire life of the remedy."

Comment 56. *Table 5-1 - Please edit this table, as necessary, when changes are made to the evaluations presented in the text.*

Response: The table will be revised for consistency with the revised text.

Comment 57. *Appendix A - Please supplement this appendix with data summary tables from the RI for contaminant concentrations in soil, in particular in the vicinity of the source area where groundwater concentrations are the greatest.*

Response: Since soil is not a media of concern in the FS, the Navy believes it is appropriate to only include groundwater data and figures from the RI in Appendix A. There are a large number of additional tables and figures in the RI for groundwater as well as the other media sampled as part of the RI. Thus the Navy recommends that the RI be used as a further resource as needed.

Comment 58. *Appendix D, Page. 2 Alternative G-3, Component 1: Overburden Mulch PRB near EMD: The line directly below this item cites a reference to an "AFCEE Mulch Barrier Guidance". Please add this guidance to the references section of the report.*

Response: Comment noted. The reference *AFCEE (2008), Technical Protocol for Enhanced Anaerobic Bioremediation Using Permeable Mulch Biowalls and Bioreactors* will be added to the references section of the report.

Comment 59. *Appendix D, Page 3 -The middle of this section makes the assumption of first order degradation in the mulch PRB for chlorinated solvents, then estimates the first-order decay coefficient, k, of 0.125 day^{-1} by citing that "Literature cites 0.1 to 0.2 day^{-1}". Please add the source or sources of this information to the references section of the report.*

Response: The source of the literature values for the first order degradation rate is also the AFCEE document mentioned above. It will be added to the references section of the report.

Comment 60. *Appendix D, Page 10 - For the purpose of clarification, somewhere in the beginning of the section Alternative G-5, Component 1: Overburden and Bedrock Source Area Enhanced Bioremediation, it should be stated where the "shaded" values are derived as well as the values that are neither shaded nor blue.*

Response: The shaded values were the values used in the preliminary design based on the aquifer characteristics and the extent and concentration of contaminants to be treated. The values that are neither shaded nor blue are calculated automatically based on the formula used in the design sheet. Notes will be added at the beginning of this section or along the calculation sheet to clarify where or how the shaded values were derived.

Comment 61. *Appendix C - The contaminant mass calculations appear to be reasonable and the constants used in the calculations (i.e. Koc, Kd, and densities, etc.) are consistent with literature values. The formulas and unit conversions used to calculate contaminant mass were able to be deduced from the spreadsheet and are appropriate for the calculation.*

Response: Comment noted.

Comment 62. *Appendix F - It is not apparent why the Biochlor model was run until MCLs were achieved for PCE, TCE, DCE, and VC because MCLs are not PRGs according to Table 2-3. Please explain.*

Response: At the time the Biochlor model was run, the PRGs had not been developed and the MCLS were used. The Navy will re-run the model to estimate the time to reach the PRGs.

Comment 63. *Appendix F - The Biochlor model was calibrated to a relatively small data set (i.e. it appears that there was only one overburden vinyl chloride detection to use in the calibration set). Even with a relatively large data set, a calibrated groundwater contaminant transport model is based on a non-unique solution to the flow and transport equations (i.e. numerous other combinations of calibration parameters could be used to provide a similar level of model calibration). As a result, other site-specific information must be incorporated into the selection of the model parameters.*

Response: Site-specific information gathered during the RI and subsequent field investigations have been incorporated into the selection of the model parameters and in the calibration process.

Comment 64. *Appendix F - In this case, degradation of the source area was the limiting parameter in determining the time to reach clean-up levels (as is often the case). As a result, downgradient sample results (i.e. MW10-303 and MW 10-411D1/D2 (for the overburden and bedrock, respectively) should have relatively less weight in the model calibration than those points close to the source (i.e. MW-10-400 and NW-302D for the overburden and bedrock, respectively). The estimation of the degradation parameters should therefore be weighted more heavily on the wells closer to the source area. However, the calibrated model performs poorly for the wells near to the source and better for downgradient wells. In addition, source area degradation and individual chlorinated volatile organic compounds (CVOC) degradation constants are the most critical calibration parameters and transport parameters such as dispersivity are less significant to the time to estimate the time to cleanup.*

Response: Comment noted. The Navy believes that the calibration makes sense based on the knowledge of what is assumed to have happened at the Site. The calibration tends to overestimate the concentrations closest to the source and is therefore conservative in the aspect of mass reduction in the most-contaminated areas of the plume. In addition, weighting the calibration points differently, as suggested by the reviewer, is not likely to impact the predicted cleanup timeframes significantly enough to alter the conclusions or recommendations of the FS.

Comment 65. *Appendix F - The Biochlor V2.2 User's Manual Addendum provides a method to estimate the source decay constant parameter. Even if a different decay constant is used, this methodology should, at a minimum, be presented to provide a basis of comparison for the source decay constant used in the model.*

Response: The source decay constant was estimated by calibrating the model to the available plume data. This is a valid method and was the method suggested by the EPA Comment Letter dated October 7, 2010. Groundwater analytical data from the source wells are not available over a long enough time period to show a consistently decreasing trend so the concentration versus time method cannot be used.

Comment 66. *Appendix F - It is uncommon at CVOC release sites that PCE is the limiting contaminant in determining the time to achieve remedial objectives. Vinyl chloride has a lower clean-up goal and is produced by the degradation of PCE and, as a result, is often the limiting contaminant in determining clean-up time. The relatively low predicted vinyl chloride concentrations are likely due to the fact that the calibrated model used the maximum literature value presented in the model documentation for the degradation rate for the vinyl chloride. The vinyl chloride degradation rate used in the model is generally consistent with aerobic biodegradation. The site investigations in the source area are inconsistent regarding the dissolved oxygen concentrations (<2 mg/l in MW10-405D1/D2 during well purging and aerobic conditions in overburden wells near the source area). Thus, because this parameter will likely vary across the site, the sensitivity of the model to the vinyl chloride degradation constant should be evaluated and a range of clean-up times should be estimated using a likely range of vinyl chloride biodegradation coefficients.*

Response: The model is calibrated well with all the considerations of the site data taken into account. The vinyl chloride (VC) concentrations are very low in the overburden groundwater, and non-detect near the EMD. This indicates that either not much biotransformation from DCE to vinyl chloride is occurring or the biotransformation from vinyl chloride to ethene is occurring rapidly. The calibration runs assign a moderate biotransformation rate (lambda) from DCE to VC. In order to meet a calibration goal that VC was below detection limits at the East Mat Ditch, the higher VC lambda was selected.

The Navy will not adjust the calibration runs, but rather agrees to use the existing calibration runs, after adjustment for the new PRGs (see the Response to Comment #62 above) and show the time to reach PRGs if the lambda is decreased for VC.

Comment 67. *Appendix F, Pages 3–6, Figures F-1 and F-2 – Although referenced in this Appendix (pages 3 – 6), these two figures have not been provided. There are two figures at the end of Appendix F (C-1 and C-2) but they are inconsistent with the referenced text (pages 3 through 6). Please review and correct.*

Response: Figures C-1 and C-2 will be replaced with Figures F-1 and F-2.

Comment 68. *Appendix F – The Biochlor simulations use modeled widths of 675 feet for overburden and 600 feet for bedrock (section 5 of input sheets); however, the plumes are not apparently that wide based on review of the FS figures. Please review and correct or clarify.*

Response: The model widths are correct. The model widths and lengths do not represent the plume widths and lengths. These values need to be larger than the final plume dimensions and/or extend to the downgradient point of concern.

Comment 69. *Appendix F - The Biochlor simulations used a plume length of 1450 feet; however, the text on page 3 of Appendix F states that the bedrock plume length was assumed to be 1200 feet. Please review and correct as appropriate for consistency.*

Response: The model lengths are correct. The model widths and lengths do not represent the plume widths and lengths. These values need to be larger than the final plume dimensions and/or extend to the downgradient point of concern.

Comment 70. *Appendix F - The two figures at the end of this appendix are not consistent with the alternative figures in Section 4.0 nor are they useful in representing the zones used for Biochlor modeling. Please review and correct the figures for consistency and to make them relevant to the Biochlor modeling assumptions.*

Response: The figures in Appendix F will be updated after re-running the model to correspond with the Biochlor modeling output.

Comment 71. *Appendix H, Tables 2A & 2B – Please provide an explanation for the high pH (>11) in groundwater samples collected from MW10-407D1? If the source of the high pH is not naturally occurring, what impact does Navy believe this measurement would have on the representativeness of the groundwater sample collected from this well? The non-detect for PCE in MW10-407D1 defines the southeast limit of the bedrock groundwater plume.*

Response: The high pH noted at MW10-407D1 may be due to the use of too much bentonite during the monitoring well construction. A similar high pH was recorded when the well was sampled in November 2006. The Navy does not believe this impacts the representativeness of the groundwater samples collected at this location.

Comment 72. *Appendix H, Table 2B - The temperature of the groundwater samples collected from MW11-128 and MW10-302 during the fall sampling round was higher than would be expected for ambient groundwater. What impact does Navy believe this could have on the interpretation of concentration trends, in particular for MW10-302, which contains detectable levels of PCE.*

Response: The weather was sunny with temperatures in the mid-70s to low 80s during the August field event. The temperatures recorded at these two locations as well as six other wells during well purging in late August 2011 were higher than expected because the flow through cells and tubing were exposed to direct sunlight. While measures were taken in the field to prevent this impact, including shielding the flow through cell and tubing, many of the monitoring wells are located in areas with no shade.

After stabilization, the groundwater samples were collected directly from the tubing coming from the well and not after the flow-through cell. It is important to note that the temperature of the actual sample would thus not have been impacted by exposure to direct sunlight and would have therefore been at or near actual groundwater temperatures (i.e. lower temperatures). For this reason the analytical data are not considered compromised nor is there an impact on the interpretation of concentration trends. The data from the two 2011 rounds indicated that the trend at MW10-302 was decreasing but it was also acknowledged in the discussion in Appendix H that the interpretation of concentration trends is based on a limited data set and may not be statistically significant.

Comment 73. *Appendix H, Table 4 - The well labels on this table are inconsistent with those presented on the groundwater sample log sheets and trend graphs. To avoid confusion, please review and correct the identifiers throughout the document to ensure consistent nomenclature. For instance, monitoring well MW-302 should be labeled MW10-302 consistent with the log sheets and trend plots.*

Response: The table will be updated to be consistent with the groundwater sample log sheets and trend graphs.

Comment 74. *Appendix I, cost estimate - The cost estimate for the excavation of saturated soils appears reasonable although slightly inflated by the 30 percent contingency applied to the total field cost. Would there be a practical technical and economic benefit if only a portion of the contaminated source area soil were removed?*

Response: This evaluation was completed in response to a request of EPA at a technical meeting on October 28, 2010. At that meeting, the area to be considered for excavation was selected based on the 10,000 µg/L PCE concentration contour. Although a smaller area could be evaluated, the selected area coincides with what may be the source area. Obviously, a smaller area will yield a lower cost. However, because of the limited number of sampling locations, there is no good justification to evaluate a smaller area.

NAVY RESPONSES TO MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION (MASSDEP) COMMENTS DATED MARCH 19, 2012
REVISED DRAFT FEASIBILITY STUDY – SOLVENT RELEASE AREA
FORMER NAVAL AIR STATION (NAS) SOUTH WEYMOUTH, MASSACHUSETTS

The Navy's responses to the MassDEP comments on the Solvent Release Area Revised Draft Feasibility Study (dated February 2012) are presented below. The MassDEP's comments are presented first (in italics) followed by Navy's responses.

***Comment 1, Section 1.3.6.1, Final Paragraph**: MassDEP does not classify aquifer yields; the report should instead indicate that MassDEP has assigned category GW-3 to site groundwater. Further, though this categorization does not trigger a requirement to cleanup site groundwater to drinking water standards, it is insufficient to rule-out the potential use of groundwater as drinking or irrigation source. The base Reuse Plan and the specific redevelopment plans of the South Shore Tri-Town Development Corporation (e.g., refer to the Navy's Summary for the Solvent Release Area Feasibility Study, dated November 7, 2011) should also be used to determine and document the reasonably foreseeable uses of groundwater.*

Response: Comment noted. The paragraph referenced in the comment will be removed from Section 1.3.6. This will keep the Section 1.3.6 discussion limited to a summary of the Baseline Risk Assessments from the RI. The following text will be added to Section 2:

> "As shown on Figure 2-1 [note, formerly Figure 1-6], the Site is located in a portion of the Base where MassGIS has not mapped any medium- or high-yield aquifers. MassDEP has assigned category GW-3 to groundwater at the Site. As a result, the Site groundwater is not part of a potentially productive aquifer and drinking the Site groundwater is not considered a reasonably foreseeable future use. The Local Redevelopment Authority, South Shore Tri-Town Development Corporation (SSTTDC), as well as the Master Developer, LNR South Shore LLC (LNR), have indicated that potable and irrigation water needs for the redevelopment can be provided by sources other than the groundwater under the SRA Site (SSTTDC/LNR, 2011). Therefore, future uses of Site groundwater for potable or irrigation purposes will be prohibited and are not exposure scenarios that will be evaluated in the FS.
>
> The extent of groundwater contamination shown on Figure 2-1 is predominantly in an area zoned for Open Space (OS-W) and recreation uses (RecD). Based on the foregoing, the reasonably foreseeable future uses of the SRA Site include indoor and outdoor commercial recreation and health and fitness clubs and some institutional uses under a special permit only."

Additional information from the November 2011 FS Summary will be added to the FS where appropriate to clarify previous mutual agreements and understandings.

***Comment 2, Section 2.1:** The results from the remedial investigation indicate that the media of concern include groundwater, surface water, and soil gas (i.e., vapor migration from groundwater).*

Response: Section 2.1 will be revised to state that the media of concern is groundwater and vapor intrusion due to volatile compounds migrating from groundwater. As noted in the FS, surface water was not identified in the RI as a medium of concern; however the FS addresses potential future exposures to surface water in the EMD due to discharge of contaminated groundwater to the EMD.

***Comment 3.** Section 2.3.1 should explain why the RAOs do not address the unacceptable risks posed by groundwater via drinking and irrigation exposure pathways (Section 1.3.6.1). Alternatively, RAO No. 4 could be modified to address these exposure pathways explicitly (e.g., prevent human exposure to site groundwater posing unacceptable risk via consumption and irrigation), with the remedial components that would be used to achieve the modified RAO integrated into the subsequently developed alternatives as follows:*

- *The drinking water pathway could be addressed by implementing a land use control that would prohibit drinking water use if the base reuse plan indicates that consumption is not a reasonably foreseeable use of site groundwater.*

Response: Please see the Response to Comment #1 above. The discussion of the LUC component of the remedial alternatives discussed in Section 4 will be revised in accordance with the November 2011 FS Summary: "A permanent LUC that prevents the use of groundwater at the SRA site for potable or irrigation purposes would be used to prevent exposure of residents to VOCs in groundwater at concentrations that pose unacceptable risk (SSTTDC/LNR, 2011)."

- *The irrigation pathway can be addressed using a land use control if the site-specific redevelopment plans of the SSTTDC do not include the include use of site groundwater for irrigation. Such plans should be documented in the report (e.g., refer to the Navy's Summary for the Solvent Release Area Feasibility Study, dated November 7, 2011). If instead the base reuse plan indicates that irrigation is a reasonably foreseeable use of site groundwater, then cleanup is necessary to allow site groundwater to be used for irrigation.*

Response: Please see the response above.

Comment 4, Section 2.4.1.1: *Appendix B indicates that the "recreational" indoor air scenario used to calculate PRGs for vapor intrusion is less conservative (e.g., 39 days per year exposure) than the typical scenarios used to assess vapor intrusion risk on non-residential property (e.g., commercial exposure scenarios). To justify using this less conservative approach, the report should document the reasons why the uses allowed by the base reuse plan and site-specific redevelopment plans of the SSTTDC would not include the typical non-residential indoor air exposure scenarios.*

Response: As discussed at the April 12, 2012 BCT meeting, the vapor intrusion (VI) PRG calculation was based on a recreational use scenario for the portion of the Site zoned as open space, where shallow groundwater contamination could result in a VI concern. The FS assumed that since shallow groundwater discharges to the EMD no VI issues would be expected south of the EMD, in the RecD area. However, as discussed at the April 12, 2012 BCT meeting, a second VI PRG will be calculated based on the recreational exposure scenarios suggested in the comment.

Comment 5, Section 2.4.1.1: *PRGs should also be developed for the irrigation pathway unless irrigation is not a reasonably foreseeable use of site groundwater (refer to Comment 3).*

Response: Please see the Responses to Comments #1 and #3.

Comment 6, Section 2.4.1 and Tables 2-1, 2-4, 4-2, 4-5, 4-8, and 4-11*: MassDEP Upper Concentration Limits should not be identified as ARARs because UCLs are not intended to be used to evaluate human health risk (they were developed to assess public welfare, 310 CMR 40.0994). Instead, as discussed during recent Navy-EPA-DEP-SSTTDC meetings, GW-2 and GW-3 standards could be used as TBCs for the development groundwater PRGs.*

Response: As discussed at the April 12, 2012 BCT meeting, UCLs will not be used but the MassDEP GW-3 standards will be added as a TBC to Section 2.4.1 and the ARARs tables referenced in the comment.

Comment 7, Section 4.2.2, Alternative G-2: Monitoring, Engineering Controls, and LUCs:

- *Permanent LUCs should not be used to avoid cleanup where cleanup is necessary to allow the uses specified in the base reuse plan. Consequently, use of a permanent LUC to prevent human consumption and industrial process exposures appears to be acceptable, but does not appear to be acceptable for dewatering, heating/cooling, or irrigation exposures unless prohibition of these uses is consistent with the site-specific redevelopment plans of the SSTTDC (refer to Comment 3).*

Response: Please see the Response to Comments #1 and #3. The LUC component of the alternatives included in the FS (e.g. permanent LUC for potable and irrigation uses and interim LUC requiring approval of construction dewatering plans) will be clarified consistent with the November 2011 FS Summary and discussions at the April 12, 2011 BCT meeting. Please see the Response to EPA Specific Comment #39.

- *Temporary LUCs can be used to prevent allowed uses that would pose unacceptable risk while cleanup is on-going. Text that appears to be intended to describe temporary LUCs is inadequate for this purpose because it does not obligate the Navy, subject to USEPA approval and MassDEP comment, to remove the LUCs after sufficient cleanup is completed to allow these uses. Consequently, descriptions of temporary LUCs should be modified to include this obligation.*

Response: As mentioned above, the LUC component of the remedial alternatives will be revised to address the permanent and interim LUCs consistent with the November 2011 FS Summary. Similar to CERCLA actions at other sites at the former NAS South Weymouth, LUC details will be developed during the remedial design. As with prior RODs, the SRA ROD will indicate that the Navy, with concurrence of EPA Region I and in consultation with the MassDEP, will develop a remedial design including LUC implementation and maintenance actions. As part of the remedial design details will be developed concerning the LUCs and lifting of interim LUCs.

- *Recently collected surface water samples (ARCADIS U.S., September 2011) indicate that concentrations of PCE in surface water exceed the associated PRG, this alternative should include an active remedial action contingency component that would be implemented if the results from the monitoring program indicate that remediation will not be completed in a reasonable timeframe.*

Response: A review of the Arcadis data tables indicates one result, PZ2 (32 µg/L) that slightly exceeds the PRG (26 µg/L); the other surface water results are well below the PRG. Alternative G-2 was developed without an active component to provide a comparison to Alternatives G-3 and G-4 which do include active components. The monitoring component for Alternative G-2 will be revised to state that if the results indicate that concentrations of contaminants in the EMD are unacceptable, then active remediation will be implemented. Similarly, the Long-Term Effectiveness discussion will be revised to state that an active remedy may be needed as a contingency in the event that unacceptable contaminant concentrations are detected in the EMD. Once the FS is complete, the need for a remedy with an active component will be considered as the Navy selects a remedy in consultation with EPA and MassDEP.

Comment 8, Section 4.2.3, Alternative G-3: One Overburden Mulch PRB, Monitoring, Engineering Controls, and LUCs:

- *Based on previous remediation experience at the base, the reducing conditions that would be induced by the installation of a mulch PRB would be expected to mobilize iron and manganese to groundwater. Consequently, this alternative should include measures to ensure that metals mobilization does not significantly impact downgradient groundwater and surface water (e.g., consider relocating PRB farther upgradient).*

Response: As noted in the description of Alternative G-3, the PRB was located to intercept the leading edge of the PCE plume. While the PRB can be moved further upgradient the objective is to keep the PRB in the upland portion of the site to avoid impacts to the delineated wetlands.

- *To assess metals mobilization, all monitoring samples collected from wells located downgradient of the PRB should be analyzed for iron and manganese.*

Response: Agreed. Analysis for iron and manganese will be added to the existing list of analytes for monitoring wells downgradient of the PRB. Note that iron and manganese are included in the list of analytes for surface water monitoring.

- *The performance of the PRB following replenishment may differ from prior performance because a different substrate would be used to replenish the PRB. Consequently, the groundwater monitoring schedule should be restarted following replenishment to ensure adequate performance monitoring.*

Response: Comment noted. Details of the monitoring program and schedule will be determined for the selected remedy during the remedial design.

- *Because this alternative does not include a source control component or active measures to address unacceptable risks upgradient of the East Mat Ditch, an active remedial action contingency component should be included to provide a response that could be implemented if the results from the monitoring program indicate that unacceptable risks will not be addressed in a reasonable timeframe.*

Response: The monitoring component of this alternative will be used to determine the timing for additional injection of electron donor substrate. Different types of substrates can be used based on the monitoring results. Since the portion of the Site upgradient of the EMD is zoned as PBC open space and is predominantly wetlands the longer time required for the PRB is considered reasonable.

Comment 9, Section 4.2.4, Alternative G-4: Two Overburden Mulch PRBs, Monitoring, Engineering Controls, and LUCs:

- *This alternative should include measures to ensure that metals mobilization does not significantly impact downgradient groundwater and surface water.*

Response: The monitoring component of this Alternative will provide data on any metals mobilization.

- *To assess metals mobilization, all monitoring samples collected from wells located downgradient of the PRBs should be analyzed for iron and manganese.*

Response: Iron and manganese are currently included in the list of analytes for surface water monitoring. Analysis for iron and manganese will be added to the existing list of analytes for monitoring wells downgradient of the PRB.

- *The performance of the PRBs following replenishment may differ from prior performance because a different substrate would be used to replenish the PRBs. Consequently, the groundwater monitoring schedule should be restarted following replenishment to ensure adequate performance monitoring.*

Response: Comment noted. Details of the monitoring program and schedule will be determined for the selected remedy during the remedial design.

- *Because this alternative does not include a source control component, an active remedial action contingency component should be included to provide a response that could be implemented if the results from the monitoring program indicate that remediation will not be completed in a reasonable timeframe.*

Response: The monitoring component of this alternative will be used to determine the timing for additional injection of electron donor substrate. Different types of substrates can be used based on the monitoring results. Since the portion of the Site upgradient of the EMD is zoned as PBC open space and is predominantly wetlands the longer time required for the PRB is considered reasonable.

Comment 10, Section 4.2.5, Alternative G-5: Overburden and Bedrock Source Area Enhanced Bioremediation, One Overburden PRB, Monitoring, Engineering Controls, and LUCs:

- *Rather than specifying an arbitrary goal of 1,000 ug/L, the source area treatment goal should be consistent with the remedy RAOs. More specifically, assuming the PRB will address the surface water RAO, the treatment goal for the source area should achieve the cleanup goals for groundwater in the upland area located north of the East Mat Ditch.*

Response: Source area treatment is one component of the overall alternative, and therefore it is unnecessary to treat the contaminants to lower levels. The treatment of the source reduces the mass and volume of contaminants that must be treated by the downgradient PRB. The LUCs would be protective until the contaminant concentrations have been reduced as the plume flows through the PRB. Since the source area is in a delineated wetland, it is unlikely that there would be any construction worker or VI exposures as there could be in the upland portion of the site north of the EMD. The detailed analysis of Alternative G-5 in Section 4.2.5.2 discusses how the alternative will meet the RAOs.

- *This alternative should include measures to ensure that metals mobilization does not significantly impact downgradient groundwater and surface water.*

Response: The monitoring component of Alternative G-5 will provide data on any metals mobilization.

- *To assess metals mobilization, all monitoring samples collected from wells located downgradient of the treatment zones should be analyzed for iron and manganese.*

Response: Iron and manganese are currently included in the list of analytes for surface water monitoring. Analysis for iron and manganese will be added to the existing list of analytes for monitoring wells downgradient of the PRB.

- *The performance of the PRB following replenishment may differ from prior performance because a different substrate would be used to replenish the PRB. Consequently, the groundwater monitoring schedule should be restarted following replenishment to ensure adequate performance monitoring.*

Response: Comment noted. Details of the monitoring program and schedule will be determined for the selected remedy during the remedial design.

- *The discussion of remedial timeframes should be clarified to allow meaningful comparison with other alternatives. Groundwater modeling results presented in Appendix F indicate that cleanup times are significantly less for this alternative than the other alternatives. For the overburden aquifer, the difference is 23 years. For the bedrock aquifer, the difference is 179 years. In addition, because PRGs are significantly higher than the assumed remedial endpoints (MCLs), the modeling results indicate that the overburden cleanup time for this alternative would be well below 100 years. The relatively short remedial timeframe expected with this alternative should be explicitly highlighted in the report.*

Response: Comment noted. More details on the estimated remedial timeframes will be added to the discussion of each alternative based on the Biochlor modeling. Note that the assumed remedial endpoints are not MCLs, as discussed in the Response to Comments #1and #3.

***Comment 11, Figure 4-1**: To account for lateral migration of vapor in the vadose zone, the area for the vapor intrusion LUC should be conservatively defined based on the extent of groundwater contamination posing potential indoor air risk and the extent of buildable upland.*

Response: The VI PRG for PCE is 220 µg/L. The LUC area shown on the figure encloses that concentration and extends beyond it to approximately the 10 µg/L contour. The final LUC area will be determined in the LUC Remedial Design.

Comment 12, Section 5.1.5: *The shorter cleanup time expected for Alternative G-5 should be noted here.*

Response: Comment noted. More details on the estimated remedial timeframes will be added to the discussion in this section.

NAVY RESPONSES TO LNR SOUTH SHORE, LLC (LNR)
COMMENTS DATED MARCH 30, 2012
REVISED DRAFT FEASIBILITY STUDY – SOLVENT RELEASE AREA
FORMER NAVAL AIR STATION (NAS) SOUTH WEYMOUTH, MASSACHUSETTS

The Navy's responses to the LNR comments on the Solvent Release Area Revised Draft Feasibility Study (dated February 2012) are presented below. LNR's comments are presented first (in italics) followed by Navy's responses.

***General Comment**: LNR South Shore, LLC ("LNR"), provides the following comments to the Revised Draft Feasibility Study Report (FS) for Site 11, Solvent Release Area (SRA), dated February 2012. By way of background, the FS was issued subsequent, and pursuant to, a Revised Summary of the FS Approach (Revised Summary) issued by the Navy on November 7, 2011. The Revised Summary incorporated the comments of the U.S. Environmental Protection Agency (EPA), the Massachusetts Department of Environmental Protection (MassDEP), South Shore Tri-Town Development Corporation (SSTTDC), and LNR to Navy's approach to the FS, based on numerous BRAC Cleanup Team (BCT) meetings and associated correspondence. The following comments note aspects of the FS that appear to be inconsistent with the approach agreed upon in the Revised Summary.*

Response: Comment noted.

Comment 1. PreliminaryRemediationGoals(PRGs)

PRGs are site specific target cleanup goals for remedial actions. Navy developed PRGs based upon site specific conditions and assumptions regarding contaminated groundwater from the SRA, as presented in Table 2-3 of the FS. The only applicable or relevant and appropriate requirement (ARAR) Navy considered was the Upper Concentration Limit (UCL) in the Massachusetts Contingency Plan (MCP). Where a risk-based PRG developed by Navy exceeded the UCL, the UCL was used instead of such risk-based PRG.

The primary contaminant of concern at the SRA is PCE in groundwater. The FS presents PRGs for groundwater derived for two scenarios: (i) Recreational User Vapor Intrusion and (ii) Construction Worker Exposure. Table 2-3 indicates that these PRGs are for "groundwater near water table surface," meaning that the PRGs apply to contaminants in shallow overburden groundwater. Navy based the PRGs on a target cancer risk level of 10^{-5}. Groundwater sampling data set forth in the August 2010 Remedial Investigation (RI) for the SRA, and additional groundwater sampling data generated by LNR in the Fall of 2011 (set forth in the Due Diligence Subsurface Investigation Report dated November 2011, prepared by Arcadis), document that concentrations of PCE and other VOCs in shallow overburden groundwater south of the East Mat Ditch (EMD) are well below the proposed PRGs set forth in the FS.

Response: Note that the November 2011 Arcadis report mentioned above was not provided to the Navy. Arcadis distributed three data tables in PDF form via email in October 2011.

Based on the foregoing, LNR provides the following specific comments regarding the PRGs set forth in the FS:

***Comment 1. A.** The Vapor Intrusion risk calculation presented in the FS is based upon a recreational user occupying a building for 39 days per year. Although this exposure scenario may be appropriate for the OS-W area of the SRA located north of the EMD, it does not seem adequate for the RecD area of the SRA (generally south of the EMD), where the Reuse Plan and Zoning By-Laws permit construction of indoor recreation facilities such as a fitness center, domed fields, and an ice rink. Such facilities will require staff and other employees to be on-site for more than 39 days per year, which has not been considered. Even for recreational users, 39 days per year seems too low. For example, a student or coach practicing or playing games five days per week during a sports season (approximately three months) would be roughly 60 days. In addition, some institutional uses are allowed in the RecD areas.*

Although all of the groundwater investigation data generated to date for the SRA shows that the concentrations of VOCs in shallow overburden groundwater south of the EMD are well below the proposed PRGs (the highest detected concentration of PCE in shallow overburden groundwater south of the EMD was 15 ug/l, compared to a selected PRG of 220 ug/L for Vapor Intrusion), the 39-day exposure scenario applied in the FS for recreational users could permit degradation of groundwater quality in the RecD area (in the form of migration of the plume or otherwise) to an extent that could necessitate additional Land Use Controls (LUCs) not currently anticipated or otherwise consistent with allowed future uses of the RecD area set forth in the Reuse Plan. For these reasons, the Vapor Intrusion risk calculation in the FS should be revised to estimate more realistically the amount of time per year that an employee or recreational user could be exposed to potential vapor intrusion, and the performance standard for remedial actions north of the EMD should be revised accordingly, if necessary.

Response: The FS, consistent with the November 2011 Summary, assumed that since shallow groundwater discharges to the EMD no VI issues would be expected south of the EMD, in the RecD area. However, as discussed at the April 12, 2012 BCT meeting, a second VI PRG will be calculated for shallow overburden groundwater in the RecD area assuming the recreational exposure scenario suggested in the comment. The existing VI PRG will not be changed; it will be applied to the open space zone north of the EMD using the recreational use scenario in the FS.

Comment 1. B. *The PRGs set forth in the SRA use contaminant concentrations that are considerably higher than the concentrations that would need to be derived for a residential scenario. Although residential uses are not allowed in the area zoned RecD, areas immediately downgradient of the RecD area are zoned for residential use. This point was specifically addressed in the Revised Summary, but it is not clear from the FS that there are potential downgradient residential receptors of uncontained groundwater contaminants. The PRGs should be revised to address the potential for groundwater contaminants to migrate through the RecD area to the downgradient residential area at unacceptable concentrations.*

Response: The RI documented that overburden groundwater discharges to the EMD; therefore shallow groundwater vapor intrusion concerns are not expected either in the RecD zone or the MUVD zone further downgradient. In addition, MassGIS datalayers show no medium- or high-yield aquifers downgradient of the SRA Site. Therefore groundwater in both the RecD and MUVD zones is classified as GW-3; use of the groundwater for drinking water purposes is not considered a reasonable forseeable use. The appropriate GW-3 values will be added to the PRG table in Section 2 of the FS.

Comment 1. C. *Table 2-3 of the FS implies that the PRGs apply only to shallow groundwater. This indicates that there are no PRGs for groundwater in bedrock, consistent with Navy's interpretation of investigation data that there is no direct route of exposure for groundwater in bedrock. However, groundwater monitoring has indicated that contaminants in bedrock are migrating south of the EMD, and there is a possibility that contaminants in bedrock groundwater could discharge to shallow groundwater or surface water downgradient of the source area. The PRGs should be revised to address the issues of the migration of contamination groundwater in bedrock.*

Response: As noted in the Response to Comment 1.B. above, GW-3 values will be included in Table 2-3 as PRGs applicable to bedrock groundwater downgradient of the EMD.

Comment 2. LandUseControls(LUCs)

The FS indicates that LUCs are expected to be similar for each of the remedial alternatives. The anticipated LUCs are described under Component 3 of Remedial Alternative G-2 on page 4-9. As currently drafted, the text suggests that restrictions on construction dewatering may apply south of the EMD, which is not consistent with the Revised Summary and is not acceptable to LNR. The Revised Summary states the following:

Concentrations of COCs detected in shallow groundwater south of the EMD by Navy have been less than Maximum Contaminant Levels (MCL) and are not expected to present a vapor intrusion risk. It is anticipated, therefore, that the EMD will be established as the LUC Compliance Boundary, such that no LUCs (other than the permanent LUC prohibiting installation of drinking water or irrigation extraction wells) will be necessary south of the EMD, thereby allowing the unrestricted development of this area pursuant to the Reuse Plan and Zoning By-Laws.

Furthermore, Navy's RI data (as well as LNR's 2011 investigation data) shows that the concentrations of contaminants in shallow overburden groundwater south of the EMD are well below the PRGs for construction worker safety and, as discussed above, for vapor intrusion as well. The concentrations of VOCs in wells immediately north of the EMD are also below these PRGs. In addition, the hydrogeology of the SRA area indicates that dewatering activities are likely to influence only small areas of groundwater due to the shallow depth to bedrock and the presence of generally fine-grained low permeability soils. For these reasons, and because the RI, the Revised Summary and the FS do not otherwise substantiate any need for construction dewatering restrictions or vapor intrusion mitigation requirements south of the EMD, the discussion of LUCs in the FS should be revised to clearly state that such LUCs are not being considered. The description of LUCs in the FS should also be revised to indicate clearly, consistent with the Revised Summary, that based upon low contaminant concentrations in shallow overburden groundwater south of the EMD, the EMD will be used as a compliance boundary to delineate LUCs imposed in the "source area" north of the EMD from the LUCs imposed south of the EMD. Moreover, consistent with the Revised Summary, the FS should state that the LUCs imposed south of the EMD will consist solely of a permanent prohibition on the installation/operation of drinking water and irrigation extraction wells.

Response: Agreed. The LUC components for Alternatives G-2 through G-5 will be revised consistent with the comments above and the November 2011 Revised Summary.

Comment 3. EngineeringControls

The Revised Summary stated that the FS will assume that a fence will be installed temporarily around the western end of the EMD. According to the Revised Summary, once groundwater monitoring indicates that PRGs for surface water have been achieved and that no unacceptable risk remains (i.e., that the remedy is operating properly and successfully), the fence would be removed. The description of the fence as an engineering control in the FS does not accurately reflect that the need for, and duration of time for, the fence in this area will be based solely upon the surface water PRG. This section of the FS should be revised to indicate clearly that the fence will be removed (or not installed in the first place) once groundwater monitoring indicates that the PRG for surface water has been achieved.

Response: Comment noted. The combination of groundwater and surface water monitoring will be used to determine the duration of the engineering controls, e.g. EMD fence. Details of the monitoring program will be developed during the remedial design. Since overburden groundwater discharges to the EMD, if the surface water monitoring indicates the PRGs are met the remedy may not be considered 'operating properly and successfully' if data from groundwater wells upgradient of the EMD indicate increasing concentrations. The engineering controls would likely need to remain in place until any impact of higher concentration groundwater discharging to the surface water in the EMD is determined through subsequent monitoring events.

NAVY RESPONSES TO ADVOCATES FOR ROCKLAND, ABINGTON, WEYMOUTH, AND HINGHAM (ARAWH) COMMENTS DATED APRIL 26, 2012
REVISED DRAFT FEASIBILITY STUDY – SOLVENT RELEASE AREA
FORMER NAVAL AIR STATION (NAS) SOUTH WEYMOUTH, MASSACHUSETTS

The Navy's responses to the AWARH comments on the Solvent Release Area Revised Draft Feasibility Study (dated February 2012) received from M. Parsons on behalf of ARAWH are presented below. The comments were prepared by Cambridge Environmental, ARAWH's consultant. ARAWH's comments are presented first (in italics) followed by Navy's responses.

Comment 1. *It was nice seeing you and others from ARAWH at the April 12, 2012 RAB meeting. We write to offer comments and observations on the February 2012 draft Feasibility Study Report for the Solvent Release Area (SRA, Site 11). We understand that the comment period has technically passed, so please pass along our apologies to the Navy. We also have a suggestion that might help us to participate in a more timely manner on future efforts. Due to our constraints on resources, we find that our review of documents is greatly facilitated by presentations such as that made on the SRA Feasibility Study (FS) at the recent RAB meeting. It would thus be very useful if such presentations could be made prior to the comment deadline, perhaps in close proximity to when draft reports are issued on key sites.*

Response: To better inform recipients of the review period for NAS South Weymouth documents, all future transmittal letters will note that comments are requested within 30 days.

Comment 2. *The discussion of Land Use Controls (LUCs) for the Solvent Release Area (SRA) at the April 12, 2012 RAB meeting indicated that the remedy will include restrictions on residential development over areas of the contaminated groundwater plume. The Feasibility Study report, however, does not discuss or depict LUCs for residential development because the LUCs are based on the present zoning and development plans for the area (which do not permit residential development in the area). However, since zoning can change, and waivers to zoning can be granted, LUCs on residential development should be explicitly included in the site remedy.*

Response: The RAB meeting discussion referred to in the comment dealt with zoning and whether restrictions on residential use are needed. None of the alternatives presented in the FS include zoning restrictions. The approach for LUCs in the SRA FS focuses on future uses of site groundwater, not the zoning of the Site. The LUCs described in the FS will restrict uses of site groundwater. The LUC component of the alternatives evaluated in the FS includes a permanent restriction on the use of site groundwater for drinking water and irrigation purposes. As noted in the comment, the SRA site is zoned for open space and recreational uses. The portion of the Site zoned as open space is also designated as a Public Benefit Conveyance (PBC). The SRA FS will not include any restrictions on residential development or other zoning established by SSTTDC.

Comment 3. *ARAWH and other concerned parties should encourage the Navy to select the most aggressive remedial option to reduce levels of groundwater contamination as quickly and completely as possible without causing additional environmental harm. In terms of the options proposed by the Navy in the feasibility study, the most comprehensive option under consideration is Alternative G-5 (Overburden and Bedrock Source Area Enhanced Bioremediation, One Overburden PRB, Monitoring, Engineering Controls, and LUCs). The bioremediation component of Alternative G-5 has the greatest possibility of reaching the deeper contamination and reducing the mass of the contamination source should dense non-aqueous phase liquid (DNAPL) be present. Also, the bioremediation component may shorten the time necessary to meet remedial goals. At present, the Navy has no precise knowledge of how long a period it will take – it could easily be several decades, but will almost certainly be longer if the bioremediation component is not included and the remedy relies only on Permeable Reactive Barriers (PRBs).*

Response: Comment noted. Once the FS is completed the evaluation of each alternative based on the CERCLA criteria will be considered as the Navy selects a remedy in consultation with EPA and

MassDEP. The time required to clean up site groundwater is one of a number of factors to be considered in remedy selection.

Comment 4. *The U.S. EPA's February 2012 comments express the important concerns that (1) the extent of contamination has not been adequately defined and (2) that the contamination source is not well understood. The latter point was affirmed in the discussion at the April 12, 2012 RAB meeting. We thus concur with the U.S. EPA's recommendations of collecting additional data prior to going forward with remediation measures. In particular, successful implementation of PRBs requires a thorough understanding of the characteristics of the aquifer and contamination.*

Response: Comment noted. Please see the Responses to the EPA comments. Note that the three alternatives with treatment components (G-3, G-4, G-5) include a pilot treatability study as part of the remedial design phase.

Comment 5. *PRBs have been successful at other sites at reducing levels of chlorinated solvents such as perchloroethylene and trichloroethylene (PCE and TCE, the main contaminants at the Solvent Release Area, though not the only ones, as pointed out in the U.S. EPA's comments). Mulch is proposed as the agent in the PRB to provide an organic source for microorganisms that will anaerobically degrade PCE and TCE. The FS states that an oil-based compound would need to be added to the PRB on a periodic basis (estimated as about five years) to replenish the "electron donor" supply. Information on the composition of this oil-based compound would be useful to determine whether there might be any safety concerns over its use and injection into groundwater. For example, if for some reason it should not be contained within the PRB, it could be released to surface water and affect the nutrient balance.*

Response: Selection of the specific electron donor substrate, as well as the design of the PRBs, monitoring, maintenance, etc. will be determined during the remedial design phase. The FS is intended to provide a conceptual description of remedial alternatives; specifics are included at the remedial design phase.

Comment 6. *Pilot studies and monitoring will thus be critical components of the PRBs, given the immediate discharge of water to the East Mat Ditch. The U.S. EPA has noted concerns over the potential of PRBs to change geochemical conditions such that greater amounts of iron and manganese may be inadvertently mobilized and released to surface water (a phenomenon observed at other parts of the base). Such releases must be avoided as they could cause considerable degradation to downstream surface water habitats in French Stream. PRBs will presumably be designed to preferentially draw groundwater through them for treatment, which will change hydrological characteristics that may be tied to surface water discharge patterns. In short, considerable care and testing will be necessary to ensure that the PRBs are designed such that they perform their intended remediation without undesirable side effects. A failure to completely dechlorinate PCE and TCE could result in the production of cis-dichloroethylene or the more toxic vinyl chloride, which undergoes anaerobic degradation relatively slowly. Frequent monitoring will be necessary to determine that the PRBs are functioning and that the electron donor substrate is replenished sufficiently frequently to achieve the desired goals.*

Response: Comment noted. Details on design of the PRBs, substrates, monitoring, maintenance, etc. will be determined during the remedial design phase. As mentioned in the Response to Comment #4 above, a pilot treatability study will be performed during the remedial design phase for the selected remedy. Monitoring is a component of each of the alternatives evaluated in the FS, except for the No Action alternative.