FINAL RESPONSES TO USEPA's JULY 3, 2003 COMMENTS ON THE DRAFT BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION UPDATE/FEASIBILITY STUDY NSB-NLON, GROTON, CONNECTICUT
October 23, 2003

GENERAL COMMENTS

Comment 1:

Since not all operable units on the base have final remedies in place, EPA believes that it may be premature to finalize the remedy for groundwater at this time. Any remedies selected for groundwater would most likely have to be issued on a contingent basis, and would not be final until all other remedies are shown to address unacceptable site risks.

Response:

Disagree with clarification. Investigations have shown that primarily groundwater at Naval Submarine Base-New London (NSB-NLON) flows through two east-west trending valleys. Supporting information for this concept was provided to the EPA in the Basewide Groundwater Operable Unit Existing Data Summary Report (TtNUS, May 1999) and Remedial Investigation (TtNUS, January 2002). Groundwater in each valley does not interact with the other as it flows toward the Thames River. Therefore, the Navy believes that remedies for groundwater in the northern and southern valleys should be considered independently. In addition, sites in upland areas (e.g. Area A Weapons Center) or hydrogeologically isolated areas that have remedies in place for source contamination should also be allowed to proceed to final remedies for groundwater.

Comment 2:

Since petroleum cleanup is outside the scope of this CERCLA document, evaluations and discussion of TPH cleanups should be removed. Alternatively, the FS could make it clear that the TPH cleanup will be addressed under State authority concomitant with the CERCLA action.

Response:

Agree with clarification. The Navy is aware that petroleum cleanups are outside the scope of CERCLA, but they are considered under the Navy's Installation Restoration Program. The information was included in the Feasibility Study to streamline reporting requirements. The Navy will add text to the report to make it clear that the TPH cleanup will be addressed under State authority (Section 22a-133k of the Regulations of Connecticut State Agencies, Remediation Standard Regulations) concomitant with any CERLCA action.

Comment 3:

The determination regarding whether a CERCLA actionable risk exists at a site should

only be based on federal risk standards. Actions proposed due to exceeding State standards need to be clearly identified.

Response:

Disagree with clarification. The NCP specifically states that State environmental laws should be considered during a Feasibility Study because the promulgated laws are ARARs. Therefore, it is appropriate to consider both Federal and State standards to determine actionable risks. This joint approach has been taken for Feasibility Studies in the past at Naval Submarine Base – New London. The Navy would like to discuss this issue further with the EPA for clarification.

Revised Response Per September 9, 2003 Meeting:

Agree. The RI Update/Feasibility Study will be revised so that actionable risks are clearly separated into those based on Federal and State standards.

Comment 4:

Many chemicals for Sites 3 and 7 are carried forward into PRG development for both soils and groundwater, as shown in Appendix C. However, it is not clear why each chemical has been retained for PRG development. To clarify this point, please add a final summary list of COCs to the text of Sections 3.2.6 for Site 3 and 3.3.5 for Site 7, or the Sections 5.1 (Site 3) and Section 6.1 for Site 7. Also, it would be useful to indicate on the Tables in Appendix C whether COCs have been retained for PRG development because of HHRA or ERA risk threshold exceedance, contaminant migration concerns or for other reasons.

Response:

Agree. A final list of COCs, as determined by the human health and ecological risk assessments and comparison to State criteria, will be added to the text in Sections 3.2.6 and 3.3.5. The rationale for retaining the COCs will also be included.

The tables in Appendix C will be updated as requested. A column will be added to the table that will include an indication of the reason for retaining the COC for PRG development. In addition, the heading in the first column of the Appendix C tables will be changed from COPC to COC for continuity with Section 3.

Comment 5:

Since the small area near the Area A Downstream (new source area 3-B) involves both petroleum and CERCLA contaminants, the Navy could choose to address the PAHs as part of a separate state-lead petroleum cleanup rather than as part of this base

groundwater OU. For CERCLA purposes, the cleanup of the PAHs could be documented as a removal action. However, if these soils are to be addressed as part of this action, Alternative-specific Chemical, Location, and Action-specific ARARs tables for the PAH-contaminated soil must be developed.

Response:

Agree with clarification. Please see the response provided for General Comment 2.

The Navy is using this Feasibility Study as a means of addressing several Federal and State programs including CERCLA and State-RCRA actions. The PAHs are believed to be present at the site as a result of Triton Road asphalt pavement. The Navy believes that the PAH-contaminated soil is not a CERCLA-contaminant and that it should only be addressed coincidentally with the petroleum-contaminated soil. This approach would exclude it from direct consideration under CERCLA. However, the Navy would like to maintain the integrity of the report and minimize further review time on the project. Therefore, additional discussions on the path forward for this matter are required with the EPA and CTDEP.

Additional Information from the September 9, 2003 Meeting:

The Navy provided further information regarding the distribution of PAH-contamination. The EPA agreed that the data supported the conceptual model that the PAH-contamination was related to Triton Road versus the Site 3-NSA. The EPA also believed that the Navy's case was enhanced by the fact that the PAH-contaminated soil would be excavated coincidentally with the TPH-contaminated soil.

Comment 6:

A better free petroleum oil delineation in the New Source Area of Site 3 needs to be developed in conjunction with the remedy selection for this area. Remedies that leave any significant amount of free petroleum oil in the subsurface will not be considered protective. Similarly, the potential impact to groundwater in the New Source Area and downgradient from the free petroleum oil may require better characterization before the selection of a remedy.

Response:

Disagree. The Navy does not believe that additional characterization will influence the remedy selection process. However, the Navy does believe that additional characterization is required prior to proceeding to a design for the site. Therefore, the Navy recommends completing a Pre-Design Investigation to further define the extent of petroleum oil contamination.

Comment 7:

Insufficient characterization of the extent of PAH contamination in the New Source Area has been completed to date. The presence of old drums in the surface soil warrants a more thorough investigation of the soil northeast of Stream 5 for any remedy that does not remove all of the contaminated soil in that area.

Response:

Disagree. The PAH contamination was shown to be localized and likely related to the Triton Road asphalt pavement, not the New Source Area. A bedrock outcrop is present northeast of Stream 5 (see Appendix A). Additional soil investigations in this area are not able to be completed.

Comment 8:

Because groundwater reportedly discharges to surface water (Stream 5), remedies considered for the New Source Area should also include surface water and sediment monitoring. The presence of free petroleum oil surrounding Stream 5 and the significant detection of vinyl chloride (more than 15 times the MCL) at well 2DMW29S warrants the addition of surface water and sediment monitoring to alternatives considered for the new source area.

Response:

Agree with clarification. See the response provided for General Comment 5. If the new source area remains in the Feasibility Study, the Navy would consider including surface water monitoring in the alternatives for the new source area. The monitoring would be focused on petroleum compounds. However, the Navy does not believe that sediment monitoring should be included in the alternatives. The Navy previously characterized and remediated contaminated sediments in Stream 5. In addition, collection of sediment samples from a relatively small stream like Stream 5 as part of a routine, long-term sediment monitoring program is not practical due to the volume of sediment required for each sampling round.

Comment 9:

A summary of the monitoring program should be added to the FS to provide an assessment specifically addressing the commitment implicit in the Phase II RI to consider groundwater monitoring results as they related to groundwater within Area A Landfill emerging via seeps in the Area A Wetlands. This new information would discuss analytical results for surface water collected in the wetlands immediately adjacent to the landfill have shown sporadic, low-level exceedances of monitoring criteria for SVOCs

and metals, with no particular indications that these are related to the landfill.

Response:

Disagree. The scope of this project was to address the sites that were recommended to proceed to a Feasibility Study in the Basewide Groundwater Operable Unit Remedial Investigation (TtNUS, January 2002). Inclusion of information related to the groundwater monitoring program for a site not included in the Feasibility Study is not appropriate.

Revised Response per September 9, 2003 Meeting:

Agree. Text summarizing the results of the Area A Landfill monitoring program will be added to Section 3.2.3 (Site 3 and 14 Nature and Extent of Contamination) of the report. This text will provide the supporting information required to make the decision that the Area A Landfill is not acting as continuing sources that could impact the remedy selected for Site 3.

Comment 10:

The groundwater that feeds the Area A Wetlands via seeps is noticeably discolored with iron precipitate. The monitoring information should be used to evaluate whether this could be related to reducing conditions in groundwater resulting from breakdown of VOCs (or any carbon source) within the Area A Landfill.

Response:

Disagree. Please see the response provided for General Comment 9.

Revised Response per September 9, 2003 Meeting:

Agree. Please see the response provided for General Comment 9.

Comment 11:

In particular, the assessment of arsenic geochemistry at the landfill is closely related to issues surrounding groundwater that might discharge to the wetlands. That assessment found that strongly reducing conditions, accompanied by high dissolved iron, are prevalent throughout the dredged material in the Area A Wetlands. The reducing conditions do not appear to be significantly influenced by the landfill. (For example, the "reference well" (2WMW21S) is not hydrologically downgradient of the landfill, but is indistinguishable chemically from the group of dredged material wells immediately northeast (downgradient) of the landfill.) An assessment of the shallower transport pathway for water passing through the fill and emerging at the toe of the riprap may address this concern.

Response:

Disagree. Please see the response provided for General Comment 9.

Revised Response per September 9, 2003 Meeting:

Agree. Please see the response provided for General Comment 9.

Comment 12:

The FS should mention that the groundwater at Goss Cove and DRMO will be monitored in accordance with the Groundwater Monitoring Plan outlined in the Operations and Maintenance Manual. It should also discuss how the groundwater at the Lower Subase will be addressed.

Response:

Disagree. Please see the response provided for General Comment 9.

Revised Response per the September 9, 2003 Meeting

Agree. Text will be added to Section 1 (Introduction) of the report that discusses the Installation Restoration Program (IRP) sites that are not included in the report and the IRP sites that are currently under monitoring programs that may require additional action in the future.

Comment 13:

The FS states that the Torpedo Shop soils will be addressed in a subsequent document. However, in recent discussions among the Navy, EPA, and the CTDEP, the Navy proposed that the Torpedo Shops be addressed as part of the Basewide Groundwater Operable Unit. EPA believes that the groundwater and soils at the Torpedo Shops should be addressed as part of this FS. Moreover, the Administrative Record should be consistent and transparent.

Response:

Disagree. The Navy is not aware of any statements in the Feasibility Study that indicated that the Torpedo Shop soil will be addressed in a subsequent document. Section 6 of the report specifically addresses Torpedo Shop soil. Remedial alternatives for soil are developed and evaluated in this section. Therefore, the EPA's comment does not appear to be correct.

Comment 14:

Chapters 5 and 6 develop remedial alternatives for groundwater entitled, "Alternative GW2 - Natural Attenuation with Monitoring and Institutional Controls" (for the combined Site 3 and Site 7 downgradient area, see page 5-32, §5.3.1; for Site 7 "near-field" area, see page 6-33, §6.3.5.1). Actionable risks to human health were exhibited in the groundwater at the Area A Weapons Center and the Torpedo Shops. The FS should evaluate institutional controls to prevent contact with and ingestion of groundwater. A remedy consisting of controls on site use and groundwater development should be evaluated.

Response:

Disagree. Alternative GW-2 is meant to be primarily an institutional controls alternative. Institutional controls are evaluated as a means of preventing contact with and ingestion of groundwater under Alternative GW2 for both the Area A Downstream and Torpedo Shops.

The EPA's reference to Area A Weapons Center does not appear to be relevant to this comment. There were no actionable risks for the Area A Weapons Center (see Section 3 of the RI Update/FS) and this site is not discussed in Sections 5 or 6.

Comment 15:

There is evidence that "natural attenuation" may already be effecting an improvement in groundwater quality at these sites, and it is entirely appropriate that alternatives considered would include a monitoring component to verify that contaminant levels decline. VOC concentrations have fallen over the period of available data, and degradation products are detected. Nevertheless, I highly recommend that the terminology chosen to describe this alternative be considered carefully. The formal protocol mapped out by EPA for a "Monitored Natural Attenuation" (MNA) remedy is quite demanding, and may not be appropriate for the magnitude of the environmental impacts that are exhibited here (i.e., relatively low concentrations of VOCs, no identification of continuing source(s)). One difficulty that might be encountered in meeting the standards of a formal MNA program is that the first-order requirement is a demonstration of source control. In the case of the CVOCs in Site 3 and Site 7 (downgradient), the source has never been identified unequivocally, and it will therefore be difficult to claim that the source has been controlled. Also, the protocol for MNA can impose a heavy demand for modeling, microbiological studies, expanded analyte lists, etc. It may serve the best interests of all parties to seek alternative terminology - such as "Institutional Controls with Monitoring."

Response:

Agree with clarification. None of the alternatives presented in the FS are

Monitored Natural Attenuation as defined by USEPA protocol. Rather, the groundwater alternatives are based on natural attenuation of site contaminants with long term monitoring to demonstrate protection and plume stability. The natural attenuation component of the alternative describes that fate and transport mechanisms for site contaminants that will degrade over time and acknowledges that both transport and degradation rates are difficult to predict. A monitoring program is used to track natural attenuation of both soil and groundwater contaminants over time to ensure protectiveness. This alternative is similar to Institutional Controls with Monitoring; however, the natural attenuation with monitoring alternative acknowledges that organic compounds do naturally degrade over time through both biological and non-biological mechanisms. An institutional control alternative implies that degradation of site contaminants is not occurring.

Comment 16:

For Site 7, groundwater sampling in the PAH contaminated area needs to be conducted as part of the remedy for Alternatives GW2 and GW3 because there reportedly have not been any groundwater samples analyzed for PAHs from this area. Sufficient well coverage should be planned to ensure adequate investigation of the contaminated area and downgradient.

Response:

Agree with clarification. Several monitoring wells are already present in this area and were used to estimate groundwater flow direction. Because of the limited area of PAH-contaminated soils and known direction of groundwater flow, only one new monitoring well is anticipated for PAH testing. If new data suggests that additional monitoring wells are required, then the wells will be added to the network and tested.

Comment 17:

Chemicals that were eliminated from the screening process because their concentrations were lower than the background concentrations need to be discussed in the risk assessment summary within the FS and their concentrations need to be evaluated as the contribution to total risks. This issue was discussed in previous comments from EPA and responses by the Navy.

Response:

A discussion of the risks associated chemicals that were eliminated on the basis of background will be added to the human health risk assessments for Sites 3, 15, and 20. No changes are proposed for Site 7 since no new samples were collected in this area.

The following text will be added to the Uncertainty Analysis in Section 3.2.4.2 for Site 3.

In accordance with U.S. Navy policy, chemicals were eliminated as COPCs on the basis of comparison to background. Manganese was the only chemical detected in Site 3 groundwater samples at concentrations that exceeded the direct contact screening criteria, but was not retained as a COPC on the basis of background. The maximum detected concentration of 674 µg/L exceeded the screening level but was less than the EPA Region 9 PRG of 880 µg/L. Potential exposures to groundwater were evaluated for construction workers (dermal contact) and future adult residents (ingestion and dermal contact). Potential risks from dermal exposures to manganese in water are insignificant (USEPA, 2001); consequently, the elimination of manganese as a COPC on the basis of background does not significantly affect the risk estimates for the construction worker since this receptor was only evaluated for dermal exposures to groundwater. Future adult residents were evaluated for ingestion and dermal contact with groundwater; therefore, the estimated risks would be higher for the future adult resident if exposures to manganese were evaluated in the HHRA. If exposures to groundwater by a future adult resident were evaluated in the HHRA, then the resulting HQ for manganese would be 0.9 and the total HI would be 3.2, which exceeds the USEPA and CTDEP acceptable level of 1.0.

The following text will be added to the Uncertainty Analysis in Section 3.4.4.2 for Site 15.

In accordance with U.S. Navy policy, chemicals were eliminated as COPCs on the basis of comparison to background. Manganese was the only chemical detected in Site 15 groundwater samples at concentrations that exceeded the direct contact screening criteria, but was not retained as a COPC on the basis of background. The maximum detected concentration of 702 µg/L exceeded the screening level but was less than the EPA Region 9 PRG of 880 µg/L. Potential exposures to groundwater were evaluated for construction workers (dermal contact) and future adult residents (ingestion and dermal contact). Potential risks from dermal exposures to manganese in water are insignificant (USEPA, 2001); consequently, the elimination of manganese as a COPC on the basis of background does not significantly affect the risk estimates for the construction worker since this receptor was only evaluated for dermal exposures to groundwater. Future adult residents were evaluated for ingestion and dermal contact with groundwater; therefore, the estimated risks would be higher for the future adult resident if exposures to manganese were evaluated in the HHRA. If exposures to groundwater by a future adult resident were evaluated in the HHRA, then the resulting HQ for manganese would be 0.8 and the total HI would be 1.1, which exceeds the USEPA and CTDEP acceptable level of 1.0. However, the HQs for the individual target organs are all less than 1.

The following text will be added to the end of Section 3.5.4.2 for Site 20.

In accordance with U.S. Navy policy, chemicals were eliminated as COPCs on the basis of comparison to background. Manganese was the only chemical detected in Site 20 groundwater samples at concentrations that exceeded the direct contact screening criteria, but was not retained as a COPC on the basis of background. The maximum detected concentration of 2350 µg/L exceeded the EPA Region 9 PRG of 880 µg/L. Potential exposures to groundwater were evaluated for construction workers (dermal contact) and future adult residents (ingestion and dermal contact). Potential risks from dermal exposures to manganese in water are insignificant (USEPA, 2001); consequently, the elimination of manganese as a COPC on the basis of background does not significantly affect the risk estimates for the construction worker since this receptor was only evaluated for dermal exposures to groundwater. Future adult residents were evaluated for ingestion and dermal contact with groundwater; therefore, the estimated risks would be higher for the future adult resident if exposures to manganese were evaluated in the HHRA. If exposures to groundwater by a future adult resident were evaluated in the HHRA, then the resulting HQ for manganese would be 2.9 and the total HI would be 3.2, which exceeds the USEPA and CTDEP acceptable level of 1.0.

SPECIFIC COMMENTS

Comment 1: Table 2-2

In previous exchanges of comments and responses between regulators and Navy, there was some discussion of the desirability to define the local groundwater flow direction in the vicinity of the New Source Area (NSA). It is noted that the larger-scale potential surface, as shown on Fig. 3-3, was shown in the DGI to be consistent with past interpretations, and with the general conceptual model for the basewide hydrology. On the more local scale, however, it is interesting to consider the potential surface and implied flow directions near the NSA. In particular, the data shown in Table 2-2 indicate a local maximum in the water level at 3TW28, and lower levels to the SE (3TW29), the SW (3TW30), and the NW (3TW27). Thus, there is a suggestion of a more radial flow away from the NSA than the expected pattern of flow coming off the elevated area of the NSA and joining the regional pattern toward the west (and discharge to the Thames River). This local groundwater flow pattern should be considered if and when any remedial design efforts are undertaken, as there may have been transport of contaminants from the NSA toward the south, expanding the area of potential downgradient impacts.

Response:

Agree. The local groundwater flow pattern will be considered during the planning stages of any additional characterization or remedial design efforts.

Please also refer to the response provide for General Comment 6.

Comment 2: p. 3-12, §3.2.3.3

The report notes that chlorinated VOCs at 2DMW29S have decreased significantly (e.g., vinyl chloride has declined from 130 micrograms per liter in the 1994 Phase II RI to 0.3 J micrograms per liter in the 2002 DGI). The conclusion from the DGI is that the most likely source of the CVOCs at this well is the septic system at Site 7. This interpretation is reasonable, and is consistent with the presence of scattered, low-level detections of CVOCs throughout Area 3. The investigation of the New Source Area (NSA) in the DGI does not seem to implicate the NSA as a likely source of the contamination at 2DMW29S, as this well does not appear to be directly downgradient of the NSA, and there were no indications from soil analyses from the NSA that CVOCs are present at significant concentrations.

Response:

Agree. Comment noted.

Comment 3: Figure 2-2

The cross-section suggests that one can expect that a significant fraction of the groundwater flow from the vicinity of the New Source Area (NSA) will discharge to Stream 5. This supports the comment made elsewhere to the effect that monitoring associated with this site should include sampling of surface water and sediment to verify that impacts are diminishing or remain minimal.

Response:

Agree with qualification. Please see the response provided for General Comment 8.

Stream 5 is probably influenced by groundwater when the water table is elevated, but typically surface water runoff contributes a significant portion of the volume of water in Stream 5. For example, the flow in Stream 5 increases and decreases significantly after storm events and Stream 5 is typically dry during the summer months. Therefore, the EPA's statement that "...a significant fraction of the groundwater flow from the vicinity of the New Source Area (NSA) will discharge to Stream 5." may not be accurate.

Comment 4: Table 2-3

For Site 15 to evaluate soils outside of excavation area, why were subsurface soil samples only analyzed for TCL VOCs and TAL metals and not for TCL SVOCs, pesticides, PCBs and acidity as well?

For Site 20 to further define contaminant trends in groundwater, why were TCL VOCs and acidity not analyzed in the groundwater samples?

Response:

The rationale for the Site 15 and Site 20 sampling and analytical program was provided in the Work Plan for Basewide Groundwater Operable Unit Data Gap Investigation (TtNUS, August 2002).

Comment 5: p. 3-37, §3.2.6

The RI update recommends No Further Action (NFA) for Site 14. This seems appropriate in that a NTCRA was performed in 2000, and the groundwater sample analyzed for the DGI showed no indications of remaining impacts.

Response:

Agree. The Navy will pursue a NFA decision document for Site 14.

Comment 6: p.3 48, §3.3.5

Bullet two lists TCE as a COC requiring further evaluation in the FS. The VOCs hexachlorobenzene, 1,4 dichlorobenzene and benzene should also be included in this bullet.

Response:

Agree with clarification. The second bulleted item discusses two separate topics. The first sentence indicates that Site 7 groundwater COCs, which include hexachlorobenzene, 1,4 dichlorobenzene, and benzene, will be evaluated in the Site 7 Feasibility Study. The second sentence indicates that TCE, also a groundwater COC, will be addressed with Site 3 groundwater COCs in the Site 3 Feasibility Study. Addition of the COC list per the response provided for General Comment 4 should help to clarify this issue.

Comment 7: p. 3-48, §3.3.5

The document recommends (second bullet) that the TCE detected in Site 7 groundwater be "evaluated collectively" with that in Site 3 groundwater. This approach is sensible, in that both areas seem to be characterized by scattered, relatively low-level detections of TCE. The document advances a plausible conceptual model (see, e.g., p. 3-36, §3.2.6) suggesting that the TCE can be traced back to the historical septic system(s) at the Torpedo Shops. Because the TCE detections in both Sites 3 and 7 show similar characteristics (scattered, relatively low concentrations, evidence of degradation), and are plausibly linked to a common source, it is logical to evaluate the TCE impacts and potential remedial approaches for the sites together.

Response:

Agree. Comment noted.

Comment 8: p. 3-54, §3.4.3.3

The document notes that TCE was detected in Site 15 groundwater only in the BGOURI, and not in the Phase II RI or the DGI. The report concludes that the TCE detected in the BGOURI may have been due to sample contamination. However, it is noted that the detection limit for TCE in the 1994 Phase II RI work was 10 micrograms per liter (see Table 3-31), while the subsequent detections in the BGOURI were 3.22, 2.76, and 16 micrograms per liter, i.e., below or close to the detection limit. Therefore, the TCE data

alone cannot discriminate between the presence of low levels of TCE (declining to <1 microgram per liter by 2002) and an anomalous sampling round in 2000.

Response:

The Navy agrees that there are limitations to the conclusions that can be made with the Phase II RI data set because of the detection limits. However, the results of the DGI (no detections of TCE in soil or groundwater) make a very good case that TCE is not a concern at Site 15 and that the BGOURI results are suspect. The Navy believes that they have made a reasonable effort to characterize the nature and extent of contamination at the site and does not believe any additional efforts are necessary.

Comment 9: p. 3-55, §3.4.3.3

The document speculates that the elevated metals found in groundwater samples from Site 15 in the BGOURI may have been because of scale build up on the well screens between the Phase II RI and the BGOURI (7 years). While plausible, this explanation would carry more weight if it were supported with data. Do the turbidity data suggest higher particulate levels in the 2000 sampling? Are iron and/or aluminum concentrations consistent? The following table shows some relevant parameters for wells 15MW-XX, extracted from the BGOURI and the DGI reports. (Note that the Fe and Al values are from filtered samples.) Turbidity was slightly higher in all samples in 2000. Aluminum was high in 15MW2S (~3 ppm) and 15MW3S (~1.6 ppm) in 2000, suggesting possible presence of clay particles that might be associated with the elevated silver analyses.

Well	BGOURI (2000)					DGI (2002)				
	ORP	DO	Turb	Fe	Al	ORP	DO	turb	Fe	Al
	mV	mg/L	NTU	Mg/L	mg/L	mV	mg/L	NTU	mg/L	mg/L
1S	147	6.11	3	1.43	ND <0.68	118	7.31	0.5	ND <0.01	ND <0.025
2S	331	9.44	3.6	ND <0.247	3.04	371	8.78	1.6	2	ND <0.035
3S	-25	1.04	7	8.6	1.65	-36	0.97	4.9	NA	NA

Response:

A reference to Table 3-32 will be added to the subject paragraph. In addition, Table 3-32 will be amended to include total and dissolved aluminum and iron concentrations. Specific conductance, temperature, and salinity will be

eliminated from the table to make room for the additional parameters. The subject text will be amended to include a discussion of the data included in Table 3-32 and whether the data does or does not support the case for scale build up as the cause of the elevated metals concentrations detected during the BGOURI.

Comment 10: p. 3-55, §3.4.3.3

The report concludes that elevated inorganics at Site 15 in the BGOURI appear to be anomalies, and that is supported by the data (see, e.g., Table 3-31). It is striking that silver, in particular, shows a "spike" in the 2000 sampling (well 15MW2S, 309 micrograms per liter in the BGOURI, and ND in both earlier (Phase II RI) and later (DGI) analyses). Oddly, silver also shows an apparent "spike" in Site 20 groundwater data (wells 2WCMW1S and 2S at 326 J and 114 J micrograms per liter, respectively; again ND in both the earlier and later analyses). Please explain.

Response:

The differences between the BGOURI and DGI sampling rounds include: (1) time between sampling efforts, (2) sampling technique (submersible versus peristaltic), and (3) project laboratories. All of these factors could influence the analytical results, but it is likely that the sampling technique and project laboratories would have the greatest impact on the analytical results. Data validation was not able to identify any data quality issues; therefore, a case was made that the sampling technique and scale build up were the cause. A description of this deduction process will be added to Section 3.4.3.3 and Section 3.5.3.3.

Comment 11: p. 3-68, §3.5.4.3

The text states, "... concentrations of inorganics in groundwater have been decreasing over time." This statement is somewhat misleading, in that it seems to imply that some sort of "attenuation" process is operating to drive a temporal trend. However, much of the discussion in Section 3.4.3, is directed toward changes in sampling methodologies. The earlier text suggested that at least some of the decreases in inorganics concentrations (particularly the changes from the BGOURI to the DGI) are because of changes in sampling (e.g., a change to a peristaltic pump from a submersible pump). It is difficult to draw conclusions regarding temporal trends in inorganics when other effects such as sample turbidity, redox conditions, etc., exert a strong influence on the analytical results.

Response:

Agree. This sentence will be changed to the following:

"As discussed in Section 3.4.3, concentrations of inorganics in groundwater have

been lower in more recent sampling rounds most likely because of changes to sampling techniques."

Comment 12: p. 4 1, §4.0

Under Chemical Specific, the example of the Clean Water Act (CWA) AWQC as an ARAR contradicts the discussion on page 4 3, which acknowledges that AWQC are not ARARs. Please correct.

Response:

To clarify this issue, the text on Page 4-1 will be revised to read "Examples of chemical-specific ARARs and TBCs include promulgated MCLs and non-promulgated Clean Water Act (CWA) AWQCs."

Comment 13: p. 4 2, §4.1

The title of this section should be corrected to "Chemical Specific ARARs and TBCs" since both are presented and discussed in this section.

Response:

Agree. The title of the headers in Section 4.0 will be revised as needed to reflect that both ARARs and TBCs are generally discussed together.

Comment 14: p. 4-5, §4.2

If contaminated soils at Site 3 are being excavated in wetland, floodplain, or the coastal zone then those location-specific ARARs should be cited. Otherwise, there are no location-specific ARARs.

Response:

Agree with clarification. Section 4.0 presents a list of most potential ARARs that may be considered in an FS. Since potential remedial actions are not defined at this point in the FS, ARAR and TBC discussions presented in Section 4.0 are intentionally more extensive then may be needed. This expanded list has the advantage of helping to ensure that ARARs are not overlooked; and in some cases potential ARARs are used to develop alternatives. This section also provides rationale for why some ARARs are not identified.

The elimination of all location-specific ARARs in the FS prior to the development of PRGs and alternatives is premature. Note that the discussion for each of the location-specific ARARs in Section 4.2 indicates that location-specific ARARs are

not expected.

As indicated under the response to General Comment 5, alternative specific ARAR tables will be developed and presented in Sections 5.0 and 6.0. These tables will present only ARARs and TBCs.

Comment 15: p. 4-6, §4.3

The only action-specific ARARs would be those that pertain to the monitoring, institutional controls, or removal of the PAH-contaminated soil at Site 3.

The PAHs disposed at Site 3 are hazardous waste, so state/federal hazardous waste standards are either relevant and appropriate for monitoring and institutional controls or applicable for removal and disposal.

Unless the removal of the PAHs generates contaminated water that is discharged into a surface waterbody or POTW, remove the citations to the CWA NPDES and pretreatment regulations. Remove RCRA standards for transporters of hazardous waste, TSDs (unless treating on site), LDR, CAMUs and Subtitle D.

Remove state citations to Water Pollution control and WQSs unless removal of the PAHs at Site 3 generates waste water that will be discharged into a surface water body.

Response:

Disagree. As discussed in the response to Comment 14, most relevant potential ARARs are presented in this section. Since PRGs and alternatives have not yet been developed, it is premature to eliminate ARARs at this point in the FS.

The Navy disagrees that the presence of PAHs at Site 3 triggers relevant and appropriate sections of Federal and State hazardous waste regulations. There is no documented evidence that listed wastes were disposed at the site. If the contaminated soils are considered for excavation and off site disposal, they would be tested in accordance with RCRA regulations (TCLP analysis) and classified accordingly. The RCRA hazardous waste regulation is not identified as an ARAR for monitoring and institutional controls. Rather, monitoring and institutional controls would be developed in accordance with CERCLA and Navy IR program requirements.

Until PRGs and alternatives have been developed, it is premature to eliminate the referenced potential ARARs.

Comment 16: Tables 4-1 & 4-2

Revise based on the previous comments. The only standards to be listed are those that

pertain to the PAH contaminated soil at Site 3. Do not list any standards with a status of "Not applicable." Change any "Potentially Applicable" to "Applicable" and explain in the Synopsis when the standard would apply.

Response:

Disagree. Tables 4-1 and 4-2 will remain unchanged in the FS and will present potential ARARs. New alternative specific ARAR tables will be developed and included in Sections 5.0 and 6.0 that present only ARARs and TBCs.

Comment 17: p. 5-1, §5.0

Remove all references to petroleum and TPH except for text that states the petroleum and TPH will be addressed under state authority. The text of the entire section needs to be revised to only discuss alternatives that address the PAH-contaminated soil at Site 3.

Response:

Disagree with clarification. Please see the responses provided for General Comments 2 and 5. The Navy's FS was developed under the Navy's IR program that is intended to address both CERCLA and RCRA regulations. As a result, the FS addresses petroleum as a COC. Further discussions with the EPA and CTDEP are required for this issue.

Revised Response per the September 9, 2003 Meeting:

Disagree with clarification. Please see the responses provided for General Comments 2 and 5.

Comment 18: p. 5 1, §5.1

There is concern relative to the reported free product petroleum in the subsurface of the New Source Area. It is not apparent that the proposed RAOs adequately address the free product or that allowing free product to remain at the site will satisfy the CT RSRs.

For #2 under Soil RAOs, please clarify the meaning of the second sentence. It does not make sense as written.

Response:

Disagree. Soil RAOs 1 to 4 specifically address petroleum contamination and protection of human health and the environment to petroleum through CT RSR numerical criteria.

The second sentence will be revised as follows.

"Since the soil to groundwater PRGs are based on theoretical concepts and cross media impacts, compliance with this RAO can also be demonstrated conclusively with site specific groundwater data. Available site data indicate that soil to groundwater migration of PAHs is not significant."

Comment 19: p. 5 2, §5.1

Under RAO Evaluation of Soil, a statement is made that PAHs are relatively immobile. While this is true for some PAHs, the PAHs of interest at Site 3 are not relatively immobile. In fact, the Pollutant Mobility Criteria concentrations for the PAHs of interest are quite low indicating that these PAHs are mobile. Please edit the discussion in the subject paragraph to clarify that the PAHs found at Site 3 are mobile and adjust the discussion accordingly.

Response:

The Navy acknowledges that the Pollutant Mobility Criteria (PMC) are good for screening level evaluations and the PMC concentrations for the PAHs of interest are relatively low, suggesting that some of the PAHs may be mobile. However, in practice and as observed at the site, PAHs are rarely observed in groundwater at environmentally significant concentrations; and as a result, the Navy considers mobility-based PRGs to be refutable based on actual site groundwater data.

The referenced sentence will be modified as follows.

"PAHs are known to be relatively immobile compared to other site contaminants such as VOCs and degrade naturally"

Revised Response:

The PAHs were determined to be associated with Triton Road; therefore, references to PAHs in Section 5 were eliminated.

Comment 20: p. 5 3, §5.1

Under RAO Evaluation of Soil, the discussion in the second full paragraph on this page states that an evaluation concluded that PAHs are not a threat to ecological receptors or groundwater. Please clarify the scope of the evaluation that is referenced. Review of the soil data for well 3TW29, for example, indicates that the benzo(a)pyrene concentration is twice the allowable PMC concentration for GB mobility, indicating that benzo(a)pyrene in soil is a threat to groundwater.

Under RAO Evaluation of Groundwater, the meaning of the second last sentence in the first paragraph is not clear. Please rewrite this sentence to clarify its meaning.

Under RAO Evaluation of Groundwater, the last sentence in the second paragraph discusses the acceptability of the site wide average groundwater contaminant concentrations. While this may be true, groundwater use is location specific so that local contaminant concentrations are drivers for evaluating the risks associated with groundwater use. Please consider revising this discussion with that point in mind.

Response:

An ecological risk assessment is provided in Section 3.2.5 of the report and was used as the basis for concluding that there was no threat to the aquatic ecological receptors. The paragraph was intended to reference surface water not groundwater. As such, the paragraph will be revised as follows:

"Potential migration of petroleum constituents from site soil to the surface water of Stream 5 was also evaluated. This evaluation concluded that hazardous constituents commonly associated with petroleum, such as PAHs and BETX, did not represent a threat to aquatic ecological receptors or the surface water."

The last two sentences will be revised as follows:

"TPH data for Site 3 groundwater are not available. However, based on expected concentrations of TPH in soil, the petroleum-contaminated soil could also impact the groundwater."

The Navy agrees that groundwater use is location specific. However, risk assessments are exposure duration and concentration dependent. In the absence of a wide spread plume or source as is commonly assumed during a risk evaluation, a small pocket of groundwater contamination would not remain at a given location for an extended time. As a result, if a well was placed at that location, then either the contaminated groundwater would move on, degrade, or be consumed. Therefore, impacts to a receptor would likewise decrease overtime. The Navy believes the sentence is appropriate.

Comment 21: p. 5 5, §5.2.1

The last sentence in this section suggests that the referenced calculation is presented in Appendix D. It is not. Please either edit the sentence or include that calculation in Appendix D.

Response:

Agree. It appears that the calculations were inadvertently left out of some of the copies of the report during reproduction. The calculations will be added as requested.

Comment 22: p. 5 10, §5.2.4.4

The discussion in this section regarding asphalt as a permeable cover is confusing in that asphalt has a relatively low permeability compared to gravel and some soil covers. For example, the second sentence in the first paragraph appears to contradict itself. It would be more appropriate to differentiate between asphalt and gravel/soil covers to make this point clear. Furthermore, minimizing infiltration is a concern at Site 3 because of the presence of mobile PAHs. Please review the discussion in this section and edit it to clarify the intent.

Response:

The text will be modified to identify asphalt as a semi-permeable cover. Asphalt is a material that is used to provide a stable surface for vehicles. Under some conditions asphalt also reduces infiltration of precipitation. However, a reduced infiltration rate is not a primary function of the material and porous or permeable surfaces can often be maintained as stable surfaces. As a result, the Navy does not want to implement a permeability requirement on a wear surface such as a road, especially if it is not required.

As discussed above, migration of PAHs from soil to groundwater is a theoretical issue that can be refuted with actual site data. The data collected to date does not document PAH migration to Site 3 groundwater and based on experience, site-related PAHs are unlikely to ever become a groundwater concern. As discussed in the FS, monitoring would be conducted to determine potential impacts of PAHs on groundwater.

Revised Response:

The PAHs were determined to be associated with Triton Road; therefore, references to PAHs in Section 5 were eliminated.

Comment 23: p. 5-14, 3

In particular, revise the discussion of ARARs based on the comments to Section 4.0. The only ARAR compliant alternatives for the soils are capping that is compliant with RCRA C/CT Soil Remediation Standards or excavation and off-site disposal.

Response:

Please see the response to Specific Comment 14. The text on Page 5-14 describes in general terms the analysis criteria. To avoid potential confusion, the examples provided in the general description will be eliminated.

Comment 24: p. 5 20, §5.2.5.3

The discussion for Alternative S2 under Overall Protection of Human Health and the Environment states that the soil cover prevents risks to human health. However, the cover at best reduces the potential for human risk. The soil between Stream 5 and Triton Road has PAH concentrations in excess of the Industrial direct contact criteria and the soil is accessible according to RIDEM definitions. Furthermore, although contamination detected to date northeast of Stream 5 does not exceed the direct contact thresholds, only limited sampling has been conducted. Based on the photographs in Appendix A that show a drum protruding from the surface soil, it is not apparent that any soil cover exists on the northeastern side of Stream 5. It would be appropriate to further characterize the surface soil northeast of Stream 5 before declaring that Alternative S2 is protective. Finally, the presence of free petroleum oil in the subsurface does represent a current threat to the environment given that it surrounds a stream that apparently receives inflow from local groundwater. It would be appropriate to review and revise the discussion in this section to address these issues.

Response:

Based on the actual site conditions, risks in excess of the USEPA acceptable risk range are not anticipated. However, since no specific action is being taken to prevent contact, the term "prevent" will be replaced with "reduce".

Revised Response per the September 9, 2003 Meeting:

Agree with clarification. Based on the actual site conditions, risks in excess of the USEPA acceptable risk range are not anticipated. However, since no specific action is being taken to prevent contact, the term "prevent" will be replaced with "reduce".

The reference to RIDEM should have been CTDEP.

The PAH-contaminated soil discussed in the comment is related to Triton Road and not the Site 3 – NSA; therefore, it should not be addressed under this CERCLA action.

The Navy does not believe that further characterization of the surface soil is required at the site. The text will be changed to indicate that based on the release mechanism and the topography, contamination is expected to be downgradient (south) of the source area and at depth. In addition, it will be mentioned that soil cover is present in the main area expected to be contaminated with petroleum product, but rusted drums are evident in the upgradient source area at the site and the lack of soil cover could result in exposure to contaminated soil in this area and result in risks to human and ecological receptors.

The text will also be modified to indicate that the presence of free petroleum oil in

the subsurface soil does represent a potential threat to the environment given that it surrounds a stream that receives some groundwater recharge. The text will also note that the Navy implemented a temporary corrective measure (i.e., installation of plastic sheeting along the stream bank prior to backfilling) during remediation of Stream 5 to minimize migration of petroleum oil to Stream 5 until a final remedy could be selected for the site.

Comment 25: p. 5 21, §5.2.5.3

The discussion for Alternative S2 under Compliance with ARARs and TBCs states that location and action specific ARARs are not applicable for this alternative. However, monitoring activities, including the drilling and development of monitoring wells do trigger action specific ARARs, and location specific ARARs would exist if Stream 5 has been determined to be wetland. Please edit the text accordingly.

Response:

Disagree. The description is accurate as presented. Drilling and development of monitoring wells would not be conducted in portions of Stream 5 classified as a wetland.

Comment 26: p. 5 23, §5.2.5.3

The discussion for Alternative S3 under Reduction of Toxicity, Mobility, and Volume Through Treatment should acknowledge that if asphalt batching is employed, this would be considered treatment and reduction of mobility would be achieved.

Response:

Disagree. The alternative identifies excavation and off site disposal of the contaminated soil and as a result does not specifically identify or require reduction of mobility except as needed for disposal. Pollutant mobility was not identified as a primary concern. As a result, credit for a potential reduction in mobility from an optional disposal technique (beneficial reuse) was not identified. Also, if an asphalt batching plant was used, testing would not be conducted to document any change in mobility.

Comment 27: p. 5 24, §5.3.1

Please clarify the third sentence in the first paragraph as it may be misleading. Were the wells with only one detection of contamination sampled more than once?

Response:

The data set referenced is complete, meaning that both one time - temporary monitoring wells and multi-sample permanent monitoring wells are addressed by this statement. See Section 3, Table 3-7 and Section 5, Figure 5-3 for more detail.

Comment 28: p. 5 24, §5.3.1

The last sentence in the second paragraph suggests that the referenced calculation is presented in Appendix D. It is not. Please either edit the sentence or include that calculation in Appendix D.

Response:

Agree. It appears that the calculations were inadvertently left out of some of the copies the report during reproduction. The calculations will be added as requested.

Comment 29: §5.4

The RI update in section 3.2.6 presents the conclusions and recommendations for Site 3. While the suggestion in the text that PAHs in groundwater were probably adhered to particulates may be accurate, it would be prudent if PAHs were included in the long term groundwater monitoring proposed for this site, given that in the HHRA risks from benzo(a)pyrene were found to exceed 1E-04. Additional rounds of groundwater samples would support the assertions made in this section regarding the particulate nature of the PAHs in the groundwater samples.

Response:

The FS includes testing of the groundwater for PAHs in the cost calculations. The text will be updated to clearly state the parameters that will be analyzed. However, it should be noted that PAH testing would be conducted only as long as required to demonstrate that PAHs are not migrating to or with groundwater, and would not necessarily be part of a long term monitoring program.

Revised Response:

The PAHs were determined to be associated with Triton Road; therefore, references to PAHs in Section 5 were eliminated.

Comment 30: p. 5 42, §5.4.2.4

The discussion under Reduction of Toxicity, Mobility, and Volume Through Treatment should acknowledge that if asphalt batching is employed, this would be considered treatment and reduction of mobility would be achieved.

Response:

Disagree. The alternative does not specifically identify the need for treatment or reduction in mobility of site contaminants. As a result, this statement is not required as part of the alternative evaluation.

Comment 31: p. 5 43, §5.4.2.5

Please present the basis for the statement that Site Wide Alternative 3 would achieve RAOs in approximately 1.5 years.

Response:

A detailed schedule estimate was not prepared or included in the FS. This estimate is based on engineering judgment because of the variety of factors (funding, contracting, signing of the ROD, etc.) that can influence schedules. The following text will be added to clarify the activities included in Alternative 3:

"Alternative 3, *which includes excavation and regrading of Site 3 soils followed by installation of monitoring wells*, would achieve RAOs in approximately 1.5 years."

Comment 32: p. 5 43, §5.4.2.7

The table presented in the cost section lists costs that do not correspond with the cost presentation in Appendix E. Rather than itemizing all the O&M costs it would be more appropriate to present only the present worth cost of the O&M. The last column should be the total present worth cost for the alternative (the sum of the capital cost and O&M present worth). Please review and correct the information in this section as appropriate.

Response:

Disagree. The net present worth costs presented in the table are for the site-wide alternatives which are combinations of the individual soil and groundwater alternative costs presented in Appendix E. For example, the net present worth cost of Site Wide Alternative 1 is $107,800. This cost is the sum of the net present worth costs of Alternative S1 – No Action ($53,900) and Alternative GW1 – No Action ($53,900).

The Navy believes that inclusion of the O&M costs in the table is useful for

showing budgetary requirements for long term planning and illustrating how the costs will be incurred in the future.

Comment 33: §6.0

Please explain why groundwater PRGs for Site 7 are included in both Tables C 2 and C 4. This explanation should be added to Section 6.

Response:

The following statement will be added to the first paragraph of Section 6.0.

"Chemicals such as trichloroethene, vinyl chloride, and hexachlorobenzene found at Site 7 are of a regional concern and will be addressed with the Site 3 groundwater. "

Comment 34: p. 6 1, §6.1

For #2 under Soil RAOs, please clarify the meaning of the second sentence; it does not appear to make sense as written.

Response:

The second sentence will be reworded as follows.

"Since the soil to groundwater PRGs are based on theoretical concepts and cross media impacts, compliance with this RAO can also be demonstrated conclusively with site specific groundwater data. Available site data indicates that soil to groundwater migration of PAHs is not significant."

Comment 35: p. 6 2, §6.1

Under RAO Evaluation of Soil, a statement is made that PAHs are known to be immobile. While some PAHs are relatively immobile, the PAHs of interest at Site 7 are not relatively immobile. In fact, the Pollutant Mobility Criteria concentrations for the PAHs of interest are quite low indicating that these PAHs are mobile. Please edit the discussion in the subject paragraph to clarify that the PAHs found at Site 7 are mobile and adjust the discussion accordingly.

Response:

The Navy acknowledges that the Pollutant Mobility Criteria (PMC) concentrations for the PAHs of interest are relatively low, suggesting that some of the PAHs may be mobile. However, the term relatively immobile is in comparison to VOCs that

were detected in site groundwater. The referenced sentence will be modified as follows.

"PAHs are known to be relatively immobile compared *to other site contaminants such as VOCs* and degrade naturally."

Comment 36: p. 6 2, §6.1

Under RAO Evaluation of Soil, a statement is made in the third paragraph that an evaluation of the erosion into an adjacent water body was made. Please elaborate on the evaluation and identify the location of the subject water body on a site figure.

Response:

A reference to Table C-3 will be added to the text. The Potential Ecological-Based PRGs presented in the table assume that soil erodes into the surface water and becomes sediment.

Comment 37: p. 6 9, §6.2.4.4

The discussion in this section regarding asphalt as a permeable cover is confusing in that asphalt has a relatively low permeability compared to gravel and some soil covers. For example, the second sentence in the first paragraph appears to contradict itself. It would be more appropriate to differentiate between asphalt and gravel/soil covers to make this point clear. Furthermore, minimizing infiltration is a concern at Site 7 because, contrary to the discussion in the third paragraph, mobile PAHs and VOCs are present in the soil at the site. Please review the discussion in this section and edit it to clarify the intent.

Response:

The text will be modified to identify asphalt as a semi-permeable cover. Asphalt is a material that is used to provide a stable surface for vehicles. Under some conditions asphalt also reduces infiltration of precipitation. However, a reduced infiltration rate is not a primary function of the material and porous or permeable surfaces can often be maintained as stable surfaces. As a result, the Navy does not want to implement a permeability requirement on a wear surface such as a road, especially if it is not required.

As discussed above, migration of PAHs is a theoretical issue that can be refuted with actual site data. The data collected to date does not document a PAH problem with Site 7 groundwater and based on experience, site-related PAHs are unlikely to ever become a groundwater concern. As discussed in the FS, monitoring would be conducted to define the potential impact of PAHs on groundwater.

Also, the flushing of VOC-contaminated soils is considered a good aspect of this technology, because as indicated, "Permeable covers allow water and air to contact waste and thereby promote natural biological and chemical destruction of contaminants."

Comment 38: p. 6 20, §6.2.5.3

The discussion for Alternative S2 under Compliance with ARARs and TBCs states that action specific ARARs are not applicable for this alternative. However, monitoring activities, including the drilling and development of monitoring wells do trigger action specific ARARs. Please edit the text accordingly.

Response:

Disagree. Monitoring well installation and monitoring would be conducted under the Navy IR Program and CERCLA. Other environmental ARARs would not apply except as stated under the appropriate work plans.

Comment 39: p. 6 22, §6.2.5.3

The discussion for Alternative S3 under Reduction of Toxicity, Mobility, and Volume Through Treatment should acknowledge that if asphalt batching is employed, this would be considered treatment and reduction of mobility would be achieved.

Response:

The alternative identifies excavation and off site disposal of the contaminated soil and does not specifically identify or require reduction of mobility, except as needed for disposal. Pollutant mobility was not identified as a primary concern and as a result, credit for a potential reduction in mobility from an optional disposal technique (beneficial reuse) was not identified. Also, if an asphalt batching plant was used, testing would not be conducted to document any change in mobility.

Comment 40: p. 6 23, §6.2.5.3

For the discussion for Alternative S3 under Short Term Effectiveness, please present the basis for the statement that RAOs would be achieved within 1.5 years.

Response:

The following text will be added,

"This alternative, *which includes excavation and regrading of Site 7 soils followed by installation of monitoring wells*, can be completed in approximately 1.5 years after the start of design activities."

Comment 41: p. 6 37, §6.3.5.2

The discussion for Alternative GW2 under Compliance with ARARs and TBCs states that action specific ARARs are not applicable for this alternative. However, monitoring activities, including the drilling and development of monitoring wells does trigger action specific ARARs. Please edit the text accordingly.

Response:

Disagree. Monitoring well installation and monitoring would be conducted under the Navy IR Program and CERCLA. Other environmental ARARs would not apply except as stated under the appropriate work plans.

Comment 42: p. 6 46, §6.4.2.7

The table presented in the cost section lists costs that do not correspond with the cost presentation in Appendix E. Rather than itemizing all the O&M costs it would be more appropriate to present only the present worth cost of the O&M. The last column should be the total present worth cost for the alternative (the sum of the capital cost and O&M present worth). Please review and correct the information in this section as appropriate.

Response:

Disagree. The net present worth costs presented in the table are for the site-wide alternatives which are combinations of the individual soil and groundwater alternative costs presented in Appendix E. For example, the net present worth cost of Site Wide Alternative 1 is $107,800. This cost is the sum of the net present worth costs of Alternative S1 – No Action ($53,900) and Alternative GW1 – No Action ($53,900).

The Navy believes that inclusion of the O&M costs in the table is useful for showing budgetary requirements for long term planning and illustrating how the costs will be incurred in the future.

Comment 43: Table 6-1

Please clarify the dichlorobenzene listing by changing it to 1,4 dichlorobenzene if that is what is intended.

Response:

Agree. Table 6-1 will be revised to clarify that the dichlorobenzene is the 1,4-form.

Comment 44: Appendix B

Table 4.5 RME, Residential child: This table summarizes the exposure factors used in this risk assessment for residential child exposure to soil. The exposure frequency used to evaluate this exposure pathway is listed as 350 days/year. In the BGOURI report, the exposure frequency used for this pathway was 150 days/year. Please verify that the value listed in this table is correct. This change is more protective by a factor of 2.3 than that used in the original BGOURI, so it will not be necessary to alter the calculations made using this exposure factor. However, text should discuss that this one exposure factor has been changed in this RI Update.

Response:

The exposure frequency of 350 days/year used for exposures to soil by child residents is incorrect. As noted above the exposure frequency should have been 150 days/year. Although a value of 350 days/year is more conservative the risks will be recalculated in the final FS using an exposure frequency of 150 days/year in order to provide consistency with the previous risk assessments. This change will not affect the conclusions of the risk assessment.

Comment 45: Appendix B.2

RAGS Part D tables were only provided for Sites 3 and 15. Please also include RAGS D tables for Sites 7 and 20.

For Sites 3 and 15, why were the risks from ingestion and dermal contact of groundwater and inhalation of air for future child resident not quantified as for future adult resident? The rationale that exposures to a child resident are less than those for an adult resident used to disregard this evaluation as provided in the RI/FS has no basis. Please include the quantitative risk evaluation for future child resident through the exposure pathways mentioned above.

Response:

Supplemental human health risk assessments were only prepared for Sites 3 and 15, therefore RAGS Part D tables were only included for these sites. RAGS Part D tables for Sites 7 and 20 were provided in the BGOURI.

As stated in the text, the risk assessments for Sites 3 and 15 were conducted following the methodology used for the BGOURI HHRA. Exposures to

groundwater by child residents were not evaluated in the BGOURI HHRA per the BGOURI Work Plan. This approach was taken because EPA Region I risk assessment methodology does not advocate evaluation of child residents and does not provide default exposure parameters for exposure to groundwater needed to conduct the calculations (EPA Region I – Risk Update No. 2, August 1994).

In addition, Sites 3 and 5 are not currently being used for residential purposes and potable water is available at the site. Residential receptors are not potential receptors under current land use and were included only to provide an indication of potential risks if the facility were to close and then be developed for residential use. A future residential land use scenario is considered unlikely given the critical nature of the facility with respect to support of the submarine fleet and national defense.

When evaluating potential exposures to groundwater, cancer risks for adult residents will be higher than cancer risks for child residents and hazard indices for adult residents will be lower than hazard indices for child residents. The difference in cancer risks and hazard indices between adult and child residents will be less than an order of magnitude. Cancer risks at Site 3 exceeded USEPA's target risk range of 10^{-4} to 10^{-6} and CTDEP's target risk level of 10^{-5}. It is likely that cancer risks for child residents would also exceed USEPA's and CTDEP's target risk range Site 3. Hazard indices for the adult resident exposed to groundwater exceeded the acceptable level of 1 at Site 3. Since the hazard indices for adult residents exceeded the accept level of 1 at Site 3 the hazard indices for child receptors would also exceed the acceptable level of 1 at this site. The results of the human health risk assessment already indicated that groundwater at Site 3 is not suitable for use as a potable water supply; therefore, revising the human health risk assessment to include potential exposures to groundwater by child residents will not change the conclusions of the human health risk assessment. Cancer risks and hazard indices were within USEPA and CTDEP acceptable levels for adult residents exposed to groundwater at Site 15 and would also be with in acceptable levels for child residents.

The following text will be added to the end of the Risk Characterization subsection in Sections 3.2.4.2.

The results of the human health risk assessment indicated that cancer risks and hazard indices exceeded USEPA and CTDEP acceptable levels for future adult residents exposed to groundwater. Even though the calculations were not performed, cancer risks and hazard indices for future child residents would also be expected to exceed USEPA and CTDEP acceptable levels.

The following text will be added to the end of the Risk Characterization subsection in Sections 3.4.4.2.

The results of the human health risk assessment indicated that cancer risks and

hazard indices were within USEPA and CTDEP acceptable levels for future adult residents exposed to groundwater. Even though the calculations were not performed, cancer risks and hazard indices for future child residents would also be expected to be within USEPA and CTDEP acceptable levels.

Comment 46: Appendix C, Tables 5-1 and 6-1

For the protection of the current receptor, the Connecticut Remediation Standard Regulations Industrial/Commercial value has been selected. Current receptors include construction workers, employees, and adolescent trespassers. While the CRSR would be protective of construction workers and employees, it is not clear that these standards are sufficiently protective of adolescent trespassers given the smaller body weight of this receptor. The FS should demonstrate that the PRGs presented are protective of this current receptor. Otherwise, risk-based PRGs for current receptors should be developed based on a trespassing adolescent receptor.

Response:

Although the adolescent trespasser has a lower body weight (43 kg) than an industrial worker (70 kg), the exposure duration for an industrial worker (25 years) is longer than the exposure duration for an adolescent trespasser (10 years). Consequently, for carcinogenic chemicals the intake for an industrial worker is approximately 1.5 times greater than the intake for an adolescent trespasser. Therefore, for carcinogenic chemicals the CRSR for industrial workers are protective of adolescent trespassers.

The preceding discussion will be added as a footnote to Table 5-1. Site 7 is a secure area, consequently adolescent trespassers were not considered to be a potential receptor group in the Phase II RI or BGOURI HHRAs. Therefore, adolescent trespassers will be removed from Table 6-1.

Comment 47: Appendix D, Site 3

The volume calculations for Site 3 are ambiguous in that it is not apparent that the first set of calculations on page 1 of 7 includes the volume removed for stability (outside the estimated area of contamination). Based on the way the sections were drawn, it appears that the contaminated area can be measured and calculated directly without the need to subtract the area removed for stability. Please review the calculations and edit the presentation to clarify what area was calculated in the first set of calculations.

Review of Figure 5 1 in this appendix suggests that the sections made to calculate the area requiring excavation for Site 3 are separated by distances that differ from the values used in the calculations on page 1 of 7. Please review the values used on page 1 of 7 for the distance between sections and correct them to be consistent with Figure 5 1. If the values are correct as presented, please provide an explanation for the apparent

difference between the distances in Figure 5 1 and those used in the calculations.

Figure D 2 is titled Estimated Extent of Petroleum Contaminated Soil; however, the figure also shows the potential extent of free petroleum oil. Since this figure is only one of several sections across the area of soil contamination and appears to be focused more on groundwater contamination, please review the figure title for consistency with the information presented and correct the title as appropriate.

Figure D 3 apparently presents significant chlorinated solvent detections in groundwater at Sites 3 and 7; however, the figure has not been used for any calculations related to groundwater contamination at Site 3 and a different figure was referenced for calculations of groundwater contamination at Site 7. Similarly, Figure D 2 has not been used for calculating the extent of groundwater contamination at Site 3, so it is not clear why the figure has been presented in Appendix D. Please clarify why Figures D 2 and D 3 have been presented in Appendix D.

Please review the figures and figure numbering used for Appendix D and edit the figures presented and their numbering for consistency.

Response:

Item 47-1: Agree. The first calculation includes the total volume to be excavated (contaminated and uncontaminated). The calculations will be revised for clarity. The following text will be added to Page 1 of 1 following the word "Calculations":

"Total excavation volume (contaminated and uncontaminated soils)."

Item 47-2: Agree. There is a discrepancy between the figure and the calculations. The distances presented in the calculation are correct, the location of each section on Figure 5-1 (calculation page 3 of 7) will be revised to illustrate the correct section locations.

In addition, all Appendix D figures will be renumbered for consistency (D-1 through D-X).

Item 47-3: Agree. The title of Figure D-2 will be changed to "Location of Petroleum Contaminated Soil and Free Petroleum Oil."

Item 47-4: Disagree. Each figure is referenced and used for calculations provided in Appendix D entitled "Appendix D Calculations – Site 3 Soil and Sites 3 and 7 Groundwater Volume and Quantity Estimates." There are four pages to the calculations. It is possible that these calculations were not copied and included in the draft version of the report as an oversight during reproduction. Reference to Figures D-1, D-2, and D-3 are also made in Section 5 of the report. The calculations will be provided in the draft final version of the RI Update/FS.

Item 47-5: Agree. The Appendix D figures will be re-numbered so that they are

consistent and consecutive (D-1 through D-X).

Comment 48: Appendix D, Site 7:

In Section 1.3.3, on page 2 of 5 of the calculation sheet, please correct the units for PAH in the last calculation line to milligrams (mg) from micrograms (µg) in two places.

In Section 2.2, on page 4 of 5 of the calculation sheet, assumptions are presented. Are these assumptions supported by data collected from the site?

In Section 2.3.3, on page 5 of 5 of the calculation sheet, please correct the units presented in the last calculation line to show the complete calculation for the conversion of micrograms of contamination per liter (µg/L) to pounds per gallon by indicating that one µg of contamination per liter of groundwater is equivalent to 10 9 pounds of contamination per pounds of groundwater. Also, the reference to PAH needs to be corrected.

Figure D 6 is titled Estimated Extent of Groundwater Contamination at Site 7, but the title appears to be incorrect because it does not present groundwater contamination. Please review and correct the figure title to be consistent with the information presented in the figure.

Response:

Item 48-1: Agree. The units in the last line of Section 1.3.3 of the calculation titled "Appendix D Calculations – Site 7 Soil and Groundwater Volume and Quantity Estimates" will be changed as follows:

"1,700 CY * 1.5 tons/CY * 8.5 mg PAH/kg-soil * 10^-6 kg/mg * 2000 lbs/ton ="

Item 48-2: Yes, the information provided in the assumptions is based on site data. For example, the porosity of 0.37 was taken directly from the BGOURI. A soil sample was collected during the RI and sent to a geotech laboratory for testing to determine the porosity. References for the data will be added for clarity.

Item 48-3: Agree. The calculations will be changed. The last calculation line in Section 2.3.3 of the calculation titled "Appendix D Calculations – Site 7 Soil and Groundwater Volume and Quantity Estimates" will be revised to read as follows;

"170,000 gallons x 258 x 10^-9 lb-Contaminants/lb-GW x 8.34 lb/gallon ="

In addition, just prior to the calculation line, the following text will be added:

"Note: 1 ug/l of Contaminants is equivalent to 10^-9 lb-Contaminants/lb-GW"

Item 48-4: Disagree. A small plume of chlorobenzene and dichlorobenzene groundwater contamination is presented on Figure D-6 along the western wall of Building 325 in the area of the former septic tank. To clarify, the title of the figure will be changed to the following:

"Estimated Extent of Chlorobenzene/Dichlorobenzene Contamination Shown with Existing and Former Utilities"

Comment 49: Appendix E

Throughout Appendix E the present worth analyses use a 7% discount rate. Per EPA guidance, the latest update to OMB Circular A 94 should be used to estimate discount rates. The latest rates were published in the update dated January 2003, and for a 30 year project, the real discount rate is 3.2%. Please revise all the cost estimates using the 3.2% discount rate.

Response:

Agree. A 7% discount rate was used for the cost estimates in this FS since historic cost estimates prepared for NSB-NLON used a 7% discount rate. However, what is important is to provide the same discount rate for all of the alternatives, not necessarily for every project. It is agreed that the latest discount rate published in the OMB Circular A 94, released in January 2003, should be used. Therefore, the discount rate will be revised from 7% to 3.2% for all alternatives.

Comment 50: Appendix E, Site 3

On page 7 of 7 of the calculation sheet, the numbers of samples are presented in the third paragraph. For years 2 4, the text should be edited to delete the phrase "per sampling event" because 39 is the total number of samples collected over the three years. Please review and correct as appropriate.

In the cost estimate for Alternative S1, the present worth analysis uses a 7% discount rate. Per EPA guidance, the latest update to OMB Circular A 94 should be used to estimate discount rates. The latest rates were published in the update dated January 2003, and for a 30 year project, the real discount rate is 3.2%. Please revise the cost estimate using the 3.2% discount rate. The same comment applies to the present worth calculations for all other alternatives.

In the capital cost estimate for Alternative S2, please reconcile the apparent discrepancy between the oversight labor time and the PPE requirement. Line items 4.5 and 4.6 suggest there is one person at the site, while line item 4.7 suggests two people for 10 days.

In the operation and maintenance cost estimate for soil characterization for Alternative S2, please include the cost of backfilling or explain why it should not be included.

In the operation and maintenance cost estimate for monitoring and reviews for Alternative S2, it appears that footnote (2) should be deleted because, according to page 1 of 7 in Appendix E, no analytical costs will be incurred after year one. Please review and correct as appropriate.

In the capital cost estimate for Alternative S3, and through the costing for every alternative, please reconcile the difference between the boring cost (line item 2.2) at $70 per foot and the monitoring well installation cost of only $24 per foot. For the limited number of soil samples collected per boring, the cost differential is excessive. Please correct as appropriate.

In the capital cost estimate for Alternative S3, please reconcile the project planning LOE of 50 hours versus the project planning LOE for Alternative S2, which was 150 hours. Please correct as appropriate.

In the capital cost estimate for Alternative S3, please reconcile line item 2.7, sampling labor, with line item 2.8, the PPE requirement for 5 people for 5 days. The labor hours do not appear to be consistent. Please correct as appropriate.

In the capital cost estimate for Alternative S3, please review the quantity of 200 days for line item 4.6, PPE. The quantity appears to be inconsistent with the labor hours. Please correct as appropriate.

In the annual capital cost summary for Alternative GW2, it is not apparent why each report costs $4,000 in year one but $8,000 each for subsequent reports. Please correct. Also, there is an error in footnote (3): change one 20 to 25. Finally, for the assumptions related to the summary table, the title page for the assumptions should not be qualified for Year 1 only.

In the operation and maintenance cost estimate for Alternative GW2, for line item 1.5, please change the Unit to days and the text under Notes to four 10 hour days. Also, please delete the reference to free product measurement in the total row.

Response:

Item 50-1: Agree. The referenced text will be changed to "Number of samples collected for years 2 through 4."

Item 50-2: Agree. Please refer to the response provided for Specific Comment 49.

Item 50-3: Agree. Line 4.7 will be revised to indicate 1 person using PPE for 10 days. Other changes will be made to the costs, as appropriate, to make them consistent with other costs estimates.

Item 50-4: The cost estimate assumes that every 10 years the Public Works Department at NSB-NLON will have to perform some type of utility repair in this area. The equipment and labor costs to excavate the soil and backfill the excavation would not be considered under the IR Program/CERCLA because the excavation and backfilling would be performed as part of the normal activities associated with utility repair. Cost items associated with the utility work that would fall under the IR Program/CERCLA include characterization of the excavated soil, disposal of the excavated soil, and importing clean backfill for the excavation. Characterization and disposal costs are included because the excavated material is assumed to be contaminated, and this cost would be outside those typically included for normal Public Works activities. The following sentence will be added to the end of the first paragraph in the "Characterization testing every 10 years" subsection on Page 2 of 7:

"The equipment and labor costs to excavate the soil and backfill the excavation are not considered in this estimate because the assumed excavation and backfilling would be performed as part of the normal activities associated with utility repair and outside of the IR Program and CERCLA."

Item 50-5: Agree. Footnote 2 describes the years that the annual reviews are to take place. The footnote will be revised as follows:

"Site reviews would occur during years 5, 10, 15, 20, 25, and 30."

Item 50-6: Agree. The cost of $70/lf is incorrect. Under this alternative soil borings will be installed using direct-push techniques. An appropriate cost for this technique is $22 per foot, which would include completion of the boring and backfilling the hole with bentonite. Other cost items associated with drilling in the S-2 and S-3 alternatives for Sites 3 and 7 will be reviewed and revised as appropriate to reflect appropriate costs.

Item 50-7: Agree. The hours presented for Line Item 1.1 Prepare Work Plan, Specifications, and Subcontractors on the Capital Costs for Alternative S2 for Site 3 appears correct at 150 hours. The hours presented for Line Item 1.1 Prepare Remedial Action Work Plan on the Capital Costs for Alternative S3 are not correct. The following line items will be included in the Project Planning costs for Alternative S3:

1.1 Prepare PDI Work Plan, Specs, and Subcontracts - 80 hours
1.2 Prepare Remedial Action Work Plan – 150 hours

Item 50-8: Agree. Line item 2.8 will be revised to include PPE for one oversight person for 5 days.

Item 50-9: The 5 people included in line item 4.6 are oversight and contractor personnel. With relocation of the road and excavation of the contaminated soil, it

is expected that excavation personnel will be on-site for two 5-day work weeks. The quantity in line item 4.6 will be updated to 50.

Item 50-10: During Year 1 it is assumed that 3 quarterly reports and 1 annual report will be prepared. During subsequent years, only an annual report will be prepared. It was assumed that the 3 quarterly reports and the 1 annual report would be cost approximately $16,000 for an average cost per report of $4,000. The actual costs of the quarterly reports would be less, while the costs of the annual report would be higher. The annual reports for the subsequent years would be more extensive and it was assumed that they would cost approximately $8,000. No changes are recommended.

Foot note 3 will be changed as indicated.

As requested, "(Year 1)", will be removed from the title of the analytical costs summary table.

Item 50-11: The suggested edits will be made.

Comment 51: Appendix E, Site 7

On page 6 of 11 in the calculation sheet, the cost for reports is presented. It is not apparent why the cost differential between the various reports should be so significant. The scope of work for quarterly reports and reports prepared in subsequent years is identical. The difference between a quarterly report and the year end report is also grossly exaggerated. Please review and correct as appropriate.

On page 8 of 11 in the calculation sheet, the value of 0.6 months in the second last sentence of the first paragraph should be 0.6 years. Please correct.

In Attachment B, under the Basis of Design Data, contaminant B should be chlorobenzene, not dichlorobenzene. Please correct.

In the capital cost estimate for Alternative S3, please reconcile the quantity for line item 1.1, 50 hours, compared to 150 hours for project planning for Alternative S3 for Site 3 and other alternatives for this FS. The quantity is not consistent. Please review and correct. Also, please reconcile the costs for line items 2.8 and 2.9, which are not consistent. Line item 2.9 appears to be incorrect.

In the capital cost estimate for Alternative S3, please review the cost for line item 4.6 that appears to be incorrect.

In the capital cost estimate for Alternative GW2, please reconcile the quantity for line item 1.1, 100 hours, compared to 150 hours for project planning for Alternative GW2 for Site 3. The quantity is not consistent. Please review and correct.

Please review line item 5.1, which is a mobilization to abandon 1 well. Since this work would occur during monitoring well installation, there is no need for a separate mobilization. Please review and correct as appropriate.

In the annual cost summary for Alternative GW2, several errors should be corrected. Under Notes for Analysis/water: 1) the reference to 11 wells is not correct. Rather 11 samples will be collected, except that 13 samples are required for the first year; 2) annual sampling for years 2-5 will be conducted, not semi annual sampling; 3) the reference to a QA sample for vanadium should apparently be deleted.

In the assumptions for the annual cost summary for Alternative GW2, the analytical costs per sampling event for subsequent years should not include costs for purge water characterization and disposal as these are assumed not to be required after year 1. Please correct as appropriate.

In the capital cost estimate for Alternative GW3, please review line items 2.1, 2.2, and 2.3 to verify the cost of $70/ft versus the cost of $24/ft used for monitoring well installation. The costs appear to be inconsistent. Also, for line items 2.7 and 2.9, the quantity should apparently be 9 drums according to the assumptions that backup these costs. Please correct as appropriate.

Response:

Item 51-1: There are a limited number of wells to be included in the monitoring program (7 wells); however, the Navy has been required by EPA to complete extensive reporting requirements for other monitoring programs at NSB-NLON. In addition, the yearly reports have typically included statistical analyses and other data evaluation techniques. The Navy believes that the costs for quarterly and annual reports are appropriate, except for the Year 1 Report. The cost for this report will be reduced to $8,000 to be consistent with the other annual reports.

Item 51-2: The text will be changed as requested.

Item 51-3: Agree. Contaminant B will be changed to chlorobenzene.

Item 51-4: Agree. The hours presented for Line Item 1.1 Prepare Work Plan, Specifications, and Subcontractors on the Capital Costs for Alternative S3 for Site 7 are not correct. The following line items will be included in the Project Planning costs for Alternative S3:

1.1 Prepare PDI Work Plan, Specs, and Subcontracts - 80 hours
1.2 Prepare Remedial Action Work Plan – 150 hours

Line item 2.9 will be revised to read "PPE (1p * 5days * 1week)" and the quantity will be revised to 5.

Item 51-5: The quantity of 200 will be revised to 150 (i.e., 5 people x 5 days x 6 weeks).

Item 51-6: The quantity for capital cost line item 1.1 for Alternative GW2, Site 7 will be revised to 150.

Item 51-7: As indicated in the calculation titled "OUFS Cost Estimate Calcs and Assumptions for Site 7" page 6 of 11 under "Abandon Monitoring Well in PAH Area" it is indicated that the new well installed in the PAH area will be abandoned following 1 year of sampling. The cost item referred to in the comment is justified; however, the actual cost ($5,268) is not correct. The cost will be changed to $1,000.

Item 51-8: The note for "Analysis/Water" on the annual costs summary table for Alternative GW2 will be revised to read "Analyze 13 samples for first year, 11 samples for following years."

The reference in the second sentence of the same note will be changed from "semi-annually for years 2 – 5" to "annually for years 2 – 5."

Agree. The reference to the QA sample for vanadium will be removed for the same note.

Item 51-9: The assumption is that contaminants in the PAH area will be not be detected after one year. Additionally, the assumption states that, there will not be any samples collected in this area of Site 7 following 1 year of sampling. However the remaining areas of Site 7 will be periodically sampled (annually for years 2, 3, and 4 and every 5 years for years 5 through 30). During this sampling, purge water will still need to be collected, characterized and disposed properly. The text in the Calculations and assumptions for Site 7 will be updated to clarify the need for characterization and disposal costs.

Item 51-10: Refer to response provided for Comment 50 (Item 50-6).

The number of drums will be updated to 9 drums.