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NSB NEW LONDON
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DEPARTMENT OF THE NAVY
NORTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
10 INDUSTRIAL HIGHWAY
MAIL STOP, #82
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IN REPLY REFER TO
5090
Ser 2556\1823\ME

JUL 27 1995

Ms. Kymberlee Keckler
Remedial Project Manager
U.S. Environmental Protection Agency
J.F.K. Federal Building (HAN-CAN1)
Boston, MA 02203-2211

RE: NAVY'S RESPONSES TO EPA'S COMMENTS ON THE DRAFT PHASE II RI REPORT FOR THE NAVAL SUBMARINE BASE - NEW LONDON, GROTON, CT

Dear Ms. Keckler:

Please find enclosed in Attachment A the Navy's responses to the Environmental Protection Agency's (EPA's) Comments on the Draft Phase II Remedial Investigation (RI) Report for Naval Submarine Base - New London (NSB-NLON), Groton, Connecticut dated April 7, 1995.

Two meetings were held between the EPA, CT DEP and the Navy to discuss and clarify issues in the EPA's comment letter. These meetings were held on June 1, 1995 (Boston) and June 29, 1995 (NSB-NLON) and the EPA, CTDEP, and Navy, were in attendance. Draft meeting minutes were prepared and distributed for these meetings. During the meetings the approach to be used for completion of the Draft Final Phase II RI was discussed and agreed upon. Several additional meetings will likely be held to refine the approach to the human health risk assessment and ecological risk assessment as new information becomes available. The responses provided in this letter were prepared based on the outcome of the two scoping meetings. It is anticipated that the Draft Final Phase II RI Report will be submitted in the Fall of 1995.

Attachment A is divided into two sections. The first section addresses the global comments, and the second section addresses specific comments EPA had on the Draft Phase II RI Report.

To expedite the Remedial Investigation/Feasibility Study (RI/FS) process at NSB-NLON, the EPA, CTDEP, and Navy are in agreement that based on the findings of the Draft Final Phase II RI and the approval of all regulatory agencies, the sites where the remedial investigation is complete, will be separated from the other sites and proceed to a FS or a No Further Action Record Of Decision (ROD). Some of the sites which proceed to a FS will likely have additional data needs, but those needs will be addressed as part of the FS. The remaining sites where there are additional concerns and additional investigations may be necessary to complete the RI, will remain in the RI stage (Phase III).

A Site Management Plan (SMP) will be developed with the support and input from the Navy, EPA, and CTDEP for the sites contained within the Draft Final Phase II RI. A SMP serves as a useful tool for identifying Installation Restoration (IR) sites/potential source areas under investigation, developing schedules and prioritizing sites for IR activities. Potential criteria for ranking of sites in the SMP include results of the human health and ecological risk assessments, Navy funding/site ranking information, and contaminant migration potential. The SMP will be submitted after the Draft Final Phase II RI.

I hope that all outstanding issues the EPA may have had regarding the Draft Phase II RI are resolved by this Response to Comment Letter. It is anticipated that the Draft Final RI will be prepared in a timely manner and submitted in the Fall of 1995. The delivery date is contingent upon subsequent meetings which will be held between the EPA, CTDEP, and the Navy. If you would have any other questions regarding the responses please do not hesitate to contact me at (610) 595-0567 ext. 162.

Sincerely,

Mark Evans

MARK EVANS
Remedial Project Manager
By direction of the
Commanding Officer

Copy to: Ms. Patti Tyler, EPA
Mr. Dale Weiss, TRC
Mr. Mark Lewis, CTDEP
Mr. Andy Stackpole, NSB-NLON
Mr. Matthew Cochran, HNUS - Pittsburgh
Mr. Corey Rich, HNUS - Pittsburgh
Mr. Robert Hubbard, HNUS - Pittsburgh
Ms. Kathy Trapp, HNUS/Sciences International
Mr. Bernard Olsen, Portsmouth NSY

ATTACHMENT A

RESPONSES TO EPA's COMMENTS ON THE
DRAFT PHASE II REMEDIAL INVESTIGATION REPORT
NAVAL SUBMARINE BASE - NEW LONDON, GROTON, CT

A.1 RESPONSES TO GENERAL EPA COMMENTS

HUMAN HEALTH RISK ASSESSMENT

Comment

I understand that the risk assessment is based on use as an existing naval base. The Navy must demonstrate that a future residential land use scenario is inappropriate for the base by providing mechanisms, such as institutional controls and financial assurance, to ensure that the property will not be used for residential or recreational purposes without further evaluation. Should the NSB close in the future, EPA expects institutional controls to be established to ensure that human health and the environment remain adequately protected.

Insufficient detail was provided to fully evaluate the risk assessment and many of the exposure scenarios are not protective of human health. This is discussed in the page-specific comments on Attachment A.

Response

Appropriate Future Residential Land Use Scenarios will be evaluated in the draft final Phase II RI. A detailed list of input parameters and scenarios for the risk assessment is being prepared and will be submitted to the EPA and CTDEP for approval. The tentative schedule for submittal of this list is July 28, 1994. The EPA is currently investigating new regulations/guidance to determine if more realistic exposure scenarios should be used in the risk assessment. If any of the new regulations are applicable, they will be used to determine the exposure scenarios to be evaluated in the draft final Phase II RI risk assessment.

Currently, it is intended that the maximum groundwater and soil concentrations detected during Phase I and Phase II for each compound will be used in the Residential Reasonable Maximum Exposure (RME) Scenario. It is also intended that the Central Tendency (CT) scenario will use the Upper Confidence Limits (UCLs). However, until the exposure scenario review and evaluation of regulations is completed, the approach to the human health risk assessment can not be completely formalized.

KS

A comprehensive discussion will be included in the risk assessment section of the draft final Phase II RI Report which documents the hypothetical nature of the Residential Land Use Scenario so that the public is not mislead by the information. As part of the discussion, Industrial and Residential Land Use Scenarios shall be compared. In addition, a discussion of the future intended use of NSB-NLON (i.e., industrial) will also be included in the RI.

The CTDEP's classification of the groundwater at NSB-NLON was discussed at the two scoping meetings. The classification greatly influences the exposure scenarios and the cleanup goals for the base. The CTDEP's regional groundwater classification map shows that many industrialized areas along the Thames River are classified as GB. Based on the current classification of the groundwater at NSB-NLON, GA or GA/GB, the Navy would be required to meet more stringent criteria for the entire base than other industrialized areas along the Thames River. CTDEP indicated, as was discussed at the June 1, 1995 meeting, that reclassification of the groundwater is possible but not guaranteed and the process may take up to one year. CTDEP is currently reviewing their groundwater standards and the possibility and procedures of getting a variance for groundwater. The EPA also indicated that under CERCLA they can issue a waiver that permits the Navy to meet less stringent groundwater criteria. The waiver would be part of the ROD. The waiver would be contingent upon the Navy's current and future land use at the base and verification that the potential for groundwater flow from the base to public wells is not possible.

JR

The database and tables to be included in the draft final Phase II RI are the following: a more extensive database which will include Phase I and Phase II data; tables summarizing detections in the Nature and

Extent sections; tables summarizing the COC selection process in an Appendix; and in-text tables summarizing COCs and exposure concentrations.

KS

DW

DR

Any analytical data from the Phase I RI which is from composite samples will be marked as such in the complete database and will not be used in the Phase II RI risk assessment. In addition, any sample which is from an area were an interim remedial action has been performed (i.e., DRMO and Spent Acid Storage Area) and the region where the sample was taken has been removed, will be marked in the complete database and not used in the Phase II RI risk assessment. In addition, any confirmatory samples analyzed during these remedial actions will be reviewed and used in the risk assessment.

ECOLOGICAL ASSESSMENT

Comment

I understand that the ecological data and revised risk assessments will be forthcoming after the data collection efforts are concluded in June 1995. However, EPA reviewed the RI to ensure that the ecological risk assessment followed an acceptable approach and that conclusions drawn from the risk characterization phase were supportable. EPA coordinated these ecological comments with the National Oceanic and Atmospheric Administration ("NOAA") who concurs with the recommendations and concerns herein. In my letter to you dated December 22, 1994, EPA recommended that you proceed with the portions of the ecological risk assessment regarding water quality, sediment quality, and benthic community structure. It is therefore unclear to me why the RI does not provide any ecological risk assessment discussions concerning the data that has been collected thus far.

The RI must determine whether potential exposure will cause adverse effects to ecological receptors and provide information concerning the nature and extent of contamination. If contaminant concentrations are below ecological effect guidelines and appropriate habitat is not present to complete an ecological exposure pathway, this must be explicitly stated in the report.

The document does not provide the rationale for the exclusion of ecological risk assessments at certain sites, including the Area A Weapons Center. The *Draft Installation Restoration Report, Section 7.0, Ecological Risk Assessment*, Subsection 7.1.2, states that the OBDANE site was not assessed because of low contaminant concentrations and the Rubble Fill at Bunker A-86 was only qualitatively assessed from a human health standpoint. However, the RI data indicates that at the OBDANE site, lead was found at a concentration of 403 mg/kg and DDTR at a concentration of 484 ug/kg. The NOAA ER-M for lead is 218 mg/kg and 50 mg/kg can cause toxicological effects on terrestrial plants (Suter *et al.*, 1993). At the Bunker A-86 Rubble Fill site, a substantial increase in PAH and DDTR concentrations over Phase I concentrations was detected.

The Weapons Center contaminant concentration information must be evaluated with respect to the following parameters: comparison to site specific background, frequency of occurrence, bioavailability, physical-chemical properties, potential for bioaccumulation, toxicity, and potential for adverse ecological effects. In addition, the RI must include the appropriate documentation to justify the exclusion of ecological risk assessments at specific sites. More specifically, an explanation must be included to discuss the rationale for not performing an ecological risk assessment at both the OBDANE site and Bunker A-86 Rubble Fill site. It appears that the contamination at these sites has not been either delineated or characterized completely.

Throughout the Volume I text, the Data Evaluation Study states that contaminants of concern ("COCs") were selected based on USEPA Region III Screening Levels. COCs for ecological risk assessment should be selected based on comparison to site/media specific background, frequency of detection, toxicity, and bioaccumulation potential (see also my letter to you dated November 15, 1994). This should be revised where appropriate.

The data tables provide the maximum and range of contaminant concentrations, but should also provide the arithmetic average concentration, treating non-detects as half the detection limit. This will allow for evaluation of two different exposure concentrations.

The RI provides limited information regarding the relationship between COCs found in the Thames River and NSB sources. The weight of evidence approach allows for a moderate level of confidence within the decision process. Since there is little information available in the literature on shellfish toxicity, a comparison to other locations used in the shellfish study does little to define the level of risk to shellfish or secondary consumers. Some discussion, where possible, of shellfish body burdens, and its toxicity to both the shellfish and their avian predators would be beneficial.

Owing to the uncertainties regarding risk characterization, the next step, as discussed with both the Navy and Menzie-Cura, would be to determine whether there is a potential for adverse ecological impact to the benthic community. The potential for risk to benthic invertebrates from elevated concentrations of various sediment contaminants may need to be investigated further for inner Goss Cove. Sediments collected from this area indicated that benthic invertebrates may be at risk from detected concentrations of pesticides, PCBs, and several metals as these contaminants were detected at concentrations above sediment guidelines. As discussed with you on January 30, 1995, the upcoming amphipod toxicity testing will enable us to assess the potential for these sediments to cause adverse ecological effects. If the results from these toxicity tests indicate a cause for concern, collection of benthic invertebrate data from inner Goss Cove may be useful.

Response

As the EPA has indicated in this comment, a substantial field effort was conducted by the Navy to investigate the ecology of the Thames River and Area A Downstream/OBDA watercourses. This additional field work was conducted to address concerns the EPA had on the Pre-Draft Ecological Risk Assessment for NSB-NLON. At the time the Draft Phase II RI Report was submitted the results of this additional field work were not available and the final scope of several of the projects was still being negotiated. Therefore, discussions on the intended approach to the ecological risk assessment were not able to be included in the Draft Phase II RI Report.

KT

Subsequent meetings between the EPA, CTDEP, Navy and Halliburton NUS have lead to the Navy agreeing to prepare an all-encompassing or Base-wide Ecological Risk Assessment for inclusion in the draft final Phase II RI Report. An outline for the proposed Base-wide Ecological Risk Assessment (BERA) was presented at the June 29, 1995 scoping meeting. The new BERA will integrate all information generated by the Navy and its contractors. This includes the information presented in the Draft Ecological Risk Assessment and the Ecological Risk Memo which were prepared by Menzie-Cura & Associates and all new ecological data collected by Halliburton NUS. The presentation format for the BERA within the draft final Phase II RI is still under discussion and will be finalized at the subsequent meetings.

The BERA will consider all existing data and areas not previously evaluated in terms of their potential risk to ecological receptors. It was agreed that assessment endpoints (i.e., aquatic species, terrestrial species, etc.) must be established and agreed upon by the EPA, CTDEP, Navy and Halliburton NUS prior to preparing the ecological risk assessment. To aid in selecting assessment endpoints a conceptual model/problem formulation for each site will be developed. Also, the scope of work for the ecological risk assessment will be prepared and agreed upon. Halliburton NUS will perform this task and it is tentatively scheduled to be completed at the end of August 1995. By allowing the EPA the opportunity to be involved in the initial scoping and approval process of the BERA it is hoped that many, if not all, of the concerns of this comment will be addressed.

An additional scoping meeting will be held after the conceptual model and scope of work information is available to finalize the approach to the BERA. It is likely that topics such as the following will be discussed at the meeting: the appropriateness of soil screening for certain sites using existing and pending

soil data and screening criteria to be provided by EPA; the need for additional data for screening; identifying problem species for each site; the approach to evaluating the Area A watershed and its subsequent discharge and impact on the Thames River; the sediment triad approach; and linking of ecological impacts to specific sources in the Lower Subase.

KT

Responses to the specific comments on the Draft Ecological Risk Assessment are addressed in Appendix A. These responses were prepared and revisions will be made to the Draft document even though major revisions will be made to the ecological risk assessment when a complete set of ecological data is available and the approach has been finalized. The responses and corrections were considered appropriate since the BERA will incorporate information from this draft document.

HYDROGEOLOGIC INVESTIGATIONS

Comment

The hydrogeological characterizations in the RI need substantial improvement. The revised RI must include more accurate groundwater flow maps, better hydraulic testing and analysis, and more developed site conceptual models. Many of the site-specific discussions of hydrogeology do not distinguish between the hydraulic properties of the various subsurface hydrostratigraphic units. In many cases, the hydraulic conductivities are *averaged* among different layers, including bedrock, silt, sand, and fill. This approach is not appropriate, and should be replaced by a site-wide compilation of hydraulic conductivity data *by hydrostratigraphic layer*. The revised RI needs to include a discussion of the hydrostratigraphy of the base. The discussion should include a description of each subsurface aquifer and aquitard. Some of the tests are not useable because the monitoring wells are screened across multiple layers. As a result, it is likely that insufficient hydraulic conductivity data exists to develop average values for this site. EPA, the Connecticut Department of Environmental Protection, and the Navy should meet soon to discuss the additional testing that needs to be performed.

Response

JPO

In general, it is agreed that revisions to the RI are necessary to improve the hydrogeological characterization of NSB-NLON. Additional field work is necessary to completely characterize hydrogeological conditions at NSB-NLON. However, the hydrogeologic testing conducted for the Phase II RI was conducted under the EPA and CTDEP approved Phase II RI Work Plan prepared by Atlantic Environmental Services, Inc. and the associated approved addenda prepared by Halliburton NUS. Therefore, additional testing would be outside the scope of work of the original Phase II RI Work Plan.

Two scoping meetings have been held subsequent to submittal of the Draft Response to Comment Letter to address these concerns. It was agreed to at these meetings that limited additional hydrogeologic testing is necessary for the completion of the draft final Phase II RI Report. Due to the potential groundwater flow component off the base to an area with residential wells, it will be necessary to verify groundwater flow directions along Route 12. This task will likely be completed by taking one (1) round of water level measurements in private wells along Route 12 or if this is not feasible, temporary wells may be used to take water level measurements. Additional hydrogeologic testing will be completed for the final design of the cap for the Area A Landfill. If the results of these tests are available, they also may be used to determine groundwater flow directions and hydrogeologic conditions for the draft final Phase II RI. In addition, it was agreed upon that those site which require additional hydrogeologic characterization based on the findings of the draft final Phase II RI, will have hydrogeologic testing (i.e., slug tests or pumping tests) done as part of a Phase III RI or a FS.

Additional accurate potentiometric surface maps (shallow overburden and bedrock), developed site conceptual models and a more comprehensive discussion of the hydrostratigraphy of the base will be included in the draft final Phase II RI Report. The hydraulic conductivity data will be reviewed and any

JPO of the tests which were performed in monitoring wells which screen multiple layers will be noted. The data will be reviewed and discarded if appropriate.

DATA PRESENTATIONS

Comment

It is unclear whether Phase I data were used in the Phase II risk assessment. The RI does not clearly indicate what data (i.e., Phase I or Phase II or both) were used in each site-specific risk assessment. The report also does not provide the rationale or justification for eliminating sample data from inclusion in the risk assessment. Finally, the RI does not provide a summary table that allows the reviewer to confirm the COC selection process. Such a table should provide the range and frequency of detection for each detected contaminant, the applicable screening level and other applicable criteria such as Maximum Contaminant Levels ("MCLs"). The revised RI needs to present this information so that EPA can determine if the risk assessment database and COC selection are appropriate. All available data of sufficient data quality must be used.

The site figures in general do not provide sufficient detail to evaluate analytical results in relation to potential source areas. The site figures need to identify all known potential source areas.

The revised RI should include graphical presentations of the nature and extent of COCs at each site. This should include both maps and cross sections for all affected media. Currently, there is insufficient interpretive information to evaluate the conclusions and recommendations.

The maps presented on the large scale drawings need to be revised using an equally spaced contour interval. The maps currently give a misleading representation of slope, since the contour intervals are unequal. A variety of line thicknesses could be used to add contours in between the regularly spaced contours to preserve the level of detail necessary to portray the groundwater elevations, bedrock topography, and topography.

Response

KS DR DW The draft final Phase II RI Report will be made to be more "user friendly" towards the reader and a more complete document than the Draft Phase II RI Report. To accomplish this the following information will be included in the draft final Phase II RI: a more extensive database which will include Phase I and Phase II data; a more complete description of the selection process for using data in the human health risk assessment; tables summarizing detections of contaminants in the Nature and Extent sections; tables summarizing the COC selection process in an Appendix; and in-text tables summarizing COCs and exposure concentrations.

CR DR KS Site figures identifying known potential source areas will be created and included in the report. A limited number of isoconcentration maps will be prepared and included to evaluate analytical results in relation to potential source areas. Analytical results to be plotted will be selected based on their overall impact to the base. The results of the COC selection process will be used to make selections for contaminants to be plotted. Contaminants such as manganese and tetrachloroethene (PCE) are likely candidates.

JPO The base-wide potentiometric surface maps will be revised using various line thicknesses. As part of the revisions, maps of shallow overburden and bedrock potentiometric surfaces from the two comprehensive rounds of groundwater level measurements (March and August of 1995) will be created. Site-specific potentiometric maps will also be created or revised as necessary.

RADIOLOGICAL DATA

Comment

The radiological data were not used in the risk assessment, and a background study was not performed to determine naturally occurring radiological levels. The summary data tables provided, however, indicate that radionuclides were evaluated in groundwater during Phase I, but they were not evaluated in Phase II nor included in the risk assessment. The revised RI should evaluate risks posed by radionuclides to potential receptors, including those present in the groundwater. A discussion of radiological contamination and comparison to background values should also be added to the revised RI.

Response

DR
DW

KS

"Radionuclides" were not evaluated in groundwater during Phase I, but were so evaluated during Round 2 of Phase II. The draft final Phase II RI will clearly address this fact and report all radionuclide-specific analysis results of Phase II, Round 2. This revision will affect Sections 6, 7, 8, 9, 11 and 13. The only radionuclide identified during the Phase II, Round 2 analysis was naturally-occurring potassium-40. It is not appropriate to evaluate risks to potential receptors from natural background radioactivity. During Phase I, certain groundwater samples were screened for both gross alpha and for gross beta radioactivity concentrations, in accordance with the EPA-approved work plan for Phase I ("Plan of Action," April 1989). Radionuclide-specific analyses were not part of this Phase I screening. Groundwater samples exceeding either the gross alpha applicable, relevant or appropriate requirement (ARAR) or gross beta ARAR during Phase I were re-analyzed for gross alpha and gross beta during Round 1 of Phase II, and were analyzed for radionuclide-specific content as part of Round 2 of the Phase II sampling, in accordance with the EPA-approved work plan for Phase II (both the "Work Plan" of May 1993, and the "Addendum to Work Plan" of October 1993). In accordance with the Phase I RI recommendations, this work plan required radionuclide-specific analyses (for only those monitoring wells exceeding either gross alpha or gross beta ARARs during Phase I) to determine the source of any readings in excess of ARAR values. The work plan did not require a background study to determine naturally occurring levels of radioactivity. The only radionuclide identified during the Phase II, Round 2 analyses was naturally occurring potassium-40. The radionuclide-specific results of the Phase II, Round 2 monitoring will be included in the draft final Phase II RI report. Extensive discussion of historical radiological work at Subase is contained in the draft Historical Radiological Assessment (HRA).

DR

ADDITIONAL DATA NEEDS

Comment

As discussed above, several issues that we have discussed still need to be resolved. The revised RI may be the appropriate place to do so. EPA requested that the Navy evaluate contamination in soils below three feet at DRMO (see letter dated February 7, 1995). EPA requested that the Navy investigate lead concentration in soils adjacent to Building 31 (see letter dated letter January 12, 1995). EPA further requested that the Navy evaluate the vertical extent of lead contamination in soils at Building 31, and any impact on groundwater (see letter dated letter November 22, 1994). The revised RI should contain this information.

The RI contains several "no further action" recommendations that cannot be substantiated with the existing information. EPA, the Connecticut Department of Environmental Protection, and the Navy must jointly decide whether additional investigations and clarifications are necessary or if it is appropriate to proceed with a No Action ROD.

The revised RI needs to present a map showing the groundwater classifications at the base. Groundwater under ten of the thirteen sites is classified as GA. Since groundwater at most sites contains contaminants in excess of MCLs or applicable health-based criteria, it is unclear why the RI concludes "no further action." This determination is not appropriate for such sites. Remedial measures must be proposed to ensure that groundwater contaminant levels are reduced and pose no risk to human health under current and potential future site conditions.

The RI analytical tables need to present the sampling date for each sample. Please note that EPA indicated in a letter dated July 22, 1994 that the July 12, 1994 sample results for Well 2DMW29S would not be accepted in the RI.

The groundwater analytical results and corresponding text sections for each site should clearly indicate whether the samples are filtered. All text and tables presenting metals concentrations in groundwater must clearly state if the data is from filtered or unfiltered samples.

The quality of the RI data cannot be assessed because the report does not include the information necessary to evaluate the data. The revised RI needs to contain an assessment of the data quality, including documenting actual collection frequency of QA/QC samples, blank contamination, precision and accuracy results, detection limits achieved, as well as the impact of any deviations from the precision, accuracy, and completeness objectives established in the QA/QC Plan.

When we met on January 4, 1995, I was informed that EPA would be receiving revised background data report soon (see also EPA's letter dated October 5, 1994). The RI appears to compare the soils data to the background data that EPA has repeatedly challenged. While it is currently unclear how this could have affected any of the RI analyses, a difference is plausible. The background soils data report should be finalized before the revised RI is issued. The revised RI should compare the soils data to the revised ranges in the finalized background soils data report.

Response

DW KS DR

The draft final Phase II RI Report will include the findings of the investigations at DRMO and Building 31. All analytical results from these investigations will be included in the draft final RI database and will be evaluated as part of the risk assessment. The need for additional investigation activities will be assessed based on the findings of the draft final RI risk assessment.

LEK

"No Further Action" was intended to be a recommendation with concurrence by all interested parties. It is hopeful that some of the sites included within the Phase II RI will have "No Further Action" recommendations based on the draft final Phase II RI. Factors which may influence this type of recommendation include the CTDEP groundwater classification; the approved human health risk assessment exposure scenarios; and the findings of the BERA.

CR KS

A map will be provided in the RI which shows CTDEP groundwater classification areas. The CTDEP's classification of the groundwater at NSB-NLON was discussed at the two scoping meetings. The classification greatly influences the exposure scenarios and the cleanup goals for the base. The CTDEP's regional groundwater classification map shows that many industrialized areas along the Thames River are classified as GB. Based on the current classification of the groundwater at NSB-NLON, GA or GA/GB, the Navy would be required to meet more stringent criteria for the entire base than other industrialized areas along the Thames River. CTDEP has indicated that reclassification of the groundwater is possible but not guaranteed and the process may take up to one year. CTDEP is currently reviewing their groundwater standards and the possibility and procedures of getting a variance for groundwater at NSB-NLON. The EPA also indicated that under CERCLA they can issue a waiver that permits the NAVY to meet less stringent groundwater criteria. The waiver would be part of the ROD. The waiver would be contingent upon the Navy's current and future land use at the base and verification that the potential for

KS groundwater flow from the base to public wells is not possible. It is likely that the Navy will seek the CTDEP variance and the EPA waiver for groundwater.

DW KS The database to be included in the draft final Phase II RI will include the sampling date for each sample. The analytical results for the samples collected by Halliburton NUS on July 12, 1995 are valid and will be used in the Phase II RI. The chain of custody was maintained for these samples and therefore there is no need to eliminate the samples from the data base. In contrast, the duplicate samples given to the EPA on this date to be analyzed had their chain of custody broken and are invalid. These results were never included in the Draft Phase II RI.

DW Footnotes identifying dissolved versus total metals analyses results will be added to the tables in question.

JPO (Section 2.0) Additional text will be provided in the draft final Phase II RI Report to address data quality, precision and accuracy, and completeness.

KS (Data Evaluation each Site) Data from the finalized/most recent version of the Background Soils Data report will be used for establishing background soil concentrations.

KS

A.2 RESPONSES TO SPECIFIC EPA COMMENTS

Comment 1, p. 1-21, ¶1

The revised RI needs to provide a discussion on how revisions to the *Background Soils Report* (July 1994) will affect the findings of the risk assessment (*i.e.*, selection of COCs and conclusions regarding need for remediation).

Response:

KS

The revised Background Soils Report will be reviewed and background information will be updated in the revised Phase II RI Report. The implications of the revisions will be addressed through modification of the background discussion in Section 3.0 (General Data Evaluation Procedures), and via modifications to the site-specific risk assessment sections of the remainder of the document. The reference to the Background Soils Report on page 1-21 will be modified to indicate that the revised report was used as the basis for the background comparison.

DW

Comment 2, p. 1-21, ¶2

Although this paragraph indicates that the results of the offsite residential well investigation are discussed in section 4.6.6, this section was not included in the RI. Results from this investigation need to be presented and included in the assessment of groundwater conditions at each site.

Response:

JPO

This section was inadvertently omitted from the draft report. A summary of the results of the offsite well survey and reference to the *Off-site Residential Well Water Data Evaluation Report* (Atlantic, July 1994) will be added to the text as Section 4.6.6. It is proposed that this be completed in this stand-alone section (including reference to any proximate sites) rather than in the individual site-specific sections. This will facilitate both preparation of the summary and EPA review.

Comment 3, p. 2-30

In the last sentence on this page, "invertebrate benthic survey" should be changed to "benthic invertebrate survey."

Response:

JPO

Agreed. The last sentence of Section 2.6 on p. 2-30 will be revised to read "benthic invertebrate survey" instead of "invertebrate benthic survey."

Comment 4, p. 3-1, ¶1

The RI should discuss if the precision and accuracy objectives presented in the QA/QC Plan have been met. The report should also describe how any failures to meet the precision and accuracy objectives impact the overall quality of the program.

The report does not provide sufficient information to determine if the detection limit objectives for all analytes described in the QA/QC Plan were achieved. Appendix D only presents detected results; the analytes that were not detected were not reported. These data should be added.

Response:

KS See follow up

The Atlantic QAPP defined precision and accuracy and referenced the NET Cambridge Laboratory QAPP for the specific criteria. Table 7.1 of the laboratory QAPP listed method-specific (CLP, SW-846, etc.) precision and accuracy criteria. All data for Phase II were validated according to these "method-specific" criteria and qualified appropriately when criteria were not met. The precision criteria outlined in the QAPP was relative percent differences of aqueous field duplicates must be less than 30% and less than 50% for solid samples. The accuracy criteria outlined in the QAPP stated percent recoveries must be between 75 and 100 percent. A section will be added to the report which discusses general information regarding precision and accuracy objectives.

DW

A revised, comprehensive database will be provided in the draft final report. The new database will include all results including nondetects and detects. Detection limits will be provided for all nondetects.

Comment 5, p. 3-3, ¶3

The revised RI needs to discuss the data validation results. The report needs to list which samples were validated in accordance with EPA Region I Guidance. Appendix D indicates that some data points were rejected, but the text does not describe why the data points were rejected.

The revised RI needs to also discuss achievement of the completeness objective presented in the QA/QC Plan. The report should discuss the impact of the rejected data points on the project completeness objectives.

Response:

KS

Refer to response to Comment 4. A section will be added to the report which discussed general information about data validation results. A revised, comprehensive database will be provided in the draft final report. The new database will include all results including rejected results. The rejected results will be qualified with a "R".

DW

DW DR

With respect to the completeness objective, it is proposed that a brief summary of data completeness (i.e. number of rejected data points per total data points) be included in the report.

Comment 6, p. 3-4, ¶1

The RI does not discuss trip blank, field blank, and equipment rinsate results. The revised RI should summarize these results and discuss the impact of any contamination that may have occurred.

The report should indicate at what frequency field quality control (field duplicates and blanks) samples were collected and if the frequency agrees with that proposed in the QA/QC Plan. If not, then a discussion of the impact of this should be provided.

Response:

JFO KS DR

Refer to the responses to Comments 4 and 5. Blank results were considered during the data validation process. The revised, comprehensive database will include all validated data with qualifiers. Quality Control (QC) samples were collected at the frequency specified in the EPA-approved work plan and addenda. A limited discussion on the frequency of collection of QC samples and the impact of QC results on data will be discussed in the Phase II RI Report.

Comment 7, p. 3-22

The first bullet should include endpoint selection, and the third bullet the risk to non-human biota.

Response:

KS

This section of the RI Report focuses on human health risk assessment procedures. The comments are considered more germane to the ecological assessment (which is not discussed in this section). It is proposed that this comment be addressed by clarifying the intent of this section by giving it a new title as follows:

"HUMAN HEALTH RISK ASSESSMENT PROCEDURES"

Comment 8, p. 3-25, ¶1

This section needs to clearly state what data were used in the comparison to Region III screening values and subsequently included in the risk assessment. The risk assessment database should include both Phase I and Phase II data. If only data from Phase II were used, sufficient justification for eliminating Phase I data, especially soil and sediment data, must be provided.

Response:

DW
DR

The draft final RI risk assessment database will include both Phase I and Phase II data. Revisions will be made to the report to incorporate the data. If it is necessary to eliminate any data, sufficient justification for eliminating the data will be provided in the text or as footnotes in the database.

Comment 9, p. 3-25, ¶2

This paragraph does not provide sufficient information to allow evaluation of the COC selection process. It appears that contaminants detected at concentrations in excess of Region III levels in Phase I soil samples could have been deleted from evaluation because the Phase II concentrations are below Region III levels.

To facilitate review, tables for each site should be provided listing all sample analysis data from Phases I and II. Then, similar to the tables provided in each site-specific section of this report, present a table that lists all contaminants detected in Phases I and II, the range and frequency of detection, appropriate screening values and MCLs, background concentration, and the reason for elimination as a COC, if applicable. Without such tables, it is not possible to evaluate the risk assessment database or the COC selection process.

Response:

KS
DR
DW

Revisions will be made to the draft report to make it more comprehensive and reader friendly. The draft final report will use both Phase I and Phase II analytical results during the COC selection process, regardless of the media. The database and tables to be included in the draft final report are the following: a more extensive database which will include Phase I and Phase II data; tables summarizing detections in the Nature and Extent sections; tables summarizing the COC selection process including screening criteria in an Appendix; and in-text tables summarizing COCs and exposure concentrations. In addition to the tables, appropriate text will be provided in the report which summarizes the COC selection process.

Comment 10, pp. 3-30, ¶2 & 3-36, ¶2

The conversion of a Reference Concentration ("RfC") or Unit Risk to a dose-based toxicity value may often be technically incorrect. The appropriateness of doing this must be evaluated on a case-by-case basis and based on a review of the literature or information from the Superfund Health Risk Technical Support Center.

Response:

KS

The procedure for converting Reference Concentrations or Unit Risks to dose-based toxicity values has historically been outlined in HEAST and is considered relatively straight-forward. Nonetheless, it is important to note that the toxicity information used throughout the risk assessment process were obtained directly from EPA sources (as footnoted in Tables 3-4 and 3-7). Any conversions from RfCs or Unit Risks will be identified and calculations will be provided to the EPA. The Navy, a regulated party, and its contractors do not have access to the Superfund Health Risk Technical Support Center. Therefore, it is requested that the EPA request such support.

Comment 11, p. 3-38, Table 3-7

IRIS and USEPA Region III list a chronic Oral Reference Dose ("RfD") of 7.00E-05 for Aroclor 1016. The RfD listed for Aroclor of 2E-05 appears incorrect.

The chronic oral RfD value listed for 2-nitroaniline was withdrawn from IRIS.

USEPA March 1994 HEAST does not list a oral chronic RfD for copper. The source of the 3.71E-02 oral RfD listed should be provided.

Both the oral and inhalation RfDs listed for 1,1,1-trichloroethane were withdrawn from IRIS/HEAST.

IRIS lists a unit risk value for beryllium of 2.4E-03. Table 3-7 currently provides no toxicity value for inhalation.

Response:

KS

The dose-response parameter tables will be checked and any errors will be corrected. However, it is requested that the EPA provide guidance regarding chemicals which do not have dose-response information listed in IRIS. On the one hand the EPA indicates that some information has been deleted from IRIS. On the other hand, the EPA indicates that it is inappropriate to eliminate chemicals from consideration based on the absence of such information (comment number 17). This comment and comment 17 appear to be at odds.

The correct RfDs for Aroclor-1016 (RfD = 7E-05 mg/kg/day) and Aroclor-1254 (RfD = 2E-05) have been included in Table 3-7. However, because RfDs are not available for the majority of the congeners, the Aroclors were evaluated as a group (i.e., the positive detections of individual Aroclors were summed on a sample by sample basis and exposure point concentrations based on total Aroclor concentrations). A hazard quotient was developed for total Aroclors using the RfD available for Aroclor-1254 which is the lower (i.e., more conservative) of the RfDs available for Aroclors. This approach results in a more comprehensive and conservative risk assessment than simply evaluating Aroclor-1016 and -1254.

As stated by the reviewer, the chronic oral RfD for 2-nitroaniline and the RfDs for 1,1,1-trichloroethane have been withdrawn. However, updated RfDs have not been suggested and the withdrawn values do appear in the January 31, 1995 version of the EPA Region III Risk-Based Concentration table. The

withdrawn RfDs are used in the baseline risk assessment (and the EPA Region III RBC table) to produce a complete risk assessment (and RBC table).

The March 1994 version of HEAST indicates that the chronic exposure benchmark value for copper is 1.3 mg/L. HEAST further comments that this value is the current drinking water standard and that DWCD (1987) concluded toxicity data were inadequate for calculation of an RfD (in terms of mg/kg/day) for copper. A footnote will be added to Table 3-7 noting that the RfD used in the baseline risk assessment (3.71E-2 mg/kg/day) is simply a dose derived assuming ingestion of 2 L/day of drinking water over a lifetime. The same value appears in the EPA Region III RBC table. The value appears in the baseline risk assessment (and the RBC table) to produce a complete risk assessment (and RBC table).

KS

Table 3-7 provides toxicity criteria for risk analysis of adverse noncarcinogenic health effects. The unit risk value is a toxicity criteria for carcinogenic risk analysis. A CSF_{inh} for beryllium has been added to Table 3-4 based on the unit risk value which appears in IRIS. The CSF_{inh} beryllium also appears in the EPA Region III RBC table and HEAST. The value will be used in the final version of the baseline risk assessment with attention to the restrictions noted in IRIS (i.e., "the unit risk should not be used if the air concentration exceeds 4 ug/m^3, since above this concentration the unit risk may not be appropriate.")

The uncertainties associated with aforementioned items will be noted in the appropriate section.

Comment 12, p. 3-58, ¶3

The decision to not consider a specific exposure pathway, *e.g.*, exposure to volatile emissions from soils, must be based on specific criteria such as a specific vapor pressure and concentration in soil. The Navy must demonstrate, based on specific criteria, that the evaluation of volatile emissions from soil is not necessary.

Response:

KS

See follow up position paper to EPA comments

Given the low concentrations of volatiles encountered in the surficial matrix at the various sites this exposure pathway was considered insignificant in the draft RI report. As discussed in the response to the global comments, the EPA will be given the opportunity to review and comment on the risk assessment exposure scenarios to be evaluated in the draft final RI prior to submission of the RI report. The risk assessment scenarios will be submitted on July 28, 1995. The EPA can address the appropriateness of this exposure pathway during the review process of the exposure scenarios.

Comment 13, pp. 3-58, ¶6 & 3-59, §3.3.3.4

Because residential areas (barracks) occur on and adjacent to the NSB, and groundwater in areas adjacent to the site supplies drinking water to private wells, the use of a future residential scenario that includes the evaluation of routine contact with groundwater and site soils seems appropriate. To demonstrate that future use of the site will remain industrial and that a future residential land use scenario is inappropriate, provide a description of the following: 1) institutional controls, such as deed restrictions, that will be put in place to protect human health and the environment by preventing human exposure to contaminants; and 2) financial assurance mechanisms to fund future cleanup consistent with a residential use should conditions change.

Response:

KS

It is the Navy's intention that NSB-NLON remain an industrial site in the future. However, to address EPA's concerns, appropriate Future Residential Land Use Scenarios will be evaluated in the draft final Phase II RI. A detailed list of input parameters and scenarios for the risk assessment is being prepared

and will be submitted to the EPA and CTDEP for approval on July 28, 1995. The EPA is currently investigating new regulations/guidance to determine if more realistic exposure scenarios should be used in the risk assessment. If any of the new regulations are applicable, they will be used to determine the exposure scenarios to be evaluated in the draft final Phase II RI risk assessment.

KS

A comprehensive discussion will also be included in the risk assessment section of the draft final Phase II RI report which documents the hypothetical nature of the Residential Land Use Scenario so that the public is not mislead by the information. As part of the discussion, Industrial and Residential Land Use Scenarios shall be compared. In addition, a discussion of the future intended use of NSB-NLON (i.e., industrial) will also be included in the RI.

A discussion of institutional controls, such as deed restrictions, and financial assurance mechanisms to fund future cleanup are considered inappropriate for a RI. These topics would be discussed in a FS or a ROD. Therefore, they will not be discussed within the RI.

Comment 14, p. 3-59, ¶1

Groundwater at most of the NSB sites under investigation (DRMO, the Area A Landfill, Wetland, and Weapons Center, the CBU Drum Storage Area, the Rubble Fill Area, the Torpedo Shops, OBDA, Area A Downstream and OBDANE) is classified as GA, a classification that requires the groundwater to be suitable for direct human consumption without the need for treatment. In addition, homes adjacent to the northeast portion of the site have on-site drinking water wells. Consequently, it seems reasonable to expect groundwater in this area of the site to meet drinking water standards. Therefore, routine exposures to groundwater via ingestion, inhalation of volatile emissions, or dermal contact should be evaluated in the risk assessment.

Response:

The CTDEP's classification of the groundwater at NSB-NLON was discussed at the two scoping meetings. The classification greatly influences the exposure scenarios and the cleanup goals for the base. The CTDEP's regional groundwater classification map shows that many industrialized areas along the Thames River are classified as GB. Based on the current classification of the groundwater at NSB-NLON, GA or GA/GB, the Navy would be required to meet more stringent criteria for the entire base than other industrialized areas along the Thames River. CTDEP indicated that reclassification of the groundwater is possible but not guaranteed and the process may take up to one year. CTDEP is currently reviewing their groundwater standards and the possibility and procedures of getting a variance for groundwater. The EPA also indicated that under CERCLA they can issue a waiver that permits the Navy to meet less stringent groundwater criteria. The waiver would be part of the ROD. The waiver would be contingent upon the Navy's current and future land-use at the base and verification that the potential for groundwater flow from the base to public wells is not possible.

JPO

It is the Navy's intention that NSB-NLON remain an industrial site in the future. However, to address EPA's concerns, appropriate Future Residential Land Use Scenarios will be evaluated in the draft final Phase II RI. A detailed list of input parameters and scenarios for the risk assessment is being prepared and will be submitted to the EPA and CTDEP for approval on July 28, 1995. The EPA is currently investigating new regulations/guidance to determine if more realistic exposure scenarios should be used in the risk assessment. If any of the new regulations are applicable, they will be used to determine the exposure scenarios to be evaluated in the draft final Phase II RI risk assessment.

KS

Comment 15, p. 3-64, Table 3-12

Body Surface Area should be presented in cm^2.

Response:

KS

Numerical values for body surface areas were presented in cm^2. However, the units for this parameter were reported incorrectly (as m^2) in Table 3-64 for dermal contact with soil. The table will be revised to reflect the correct units.

Comment 16, p. 3-70, ¶3

The algorithm presented on this page is not appropriate for estimating exposure via dermal contact with surface or groundwater. EPA's dermal risk assessment guidance dated January 1992 should be consulted. It provides a method for estimating the absorbed dose per cm^2 of exposed skin occurring during a single water contact. This method accounts for the non steady-state conditions that characterize short exposure periods and generally provides a more conservative total absorbed dose.

Response:

KS

It is agreed that the algorithm presented on page 3-70 does not match those presented for organics in the EPA's dermal risk assessment guidance document dated January 1992. However, it should be noted that the January 1992 guidance (pages 5-51 and 5-52) also cautions the reader that "this procedure for organics is based on a recently developed model which is currently being reviewed by the scientific community". The model has advantages; however, the guidance indicates that "Preliminary testing shows that this new approach provides a conservative total absorbed dose over the traditional steady-state equation for organic compounds."....."and that the dermal dose resulting from 10 minute showers exceed the dose associated with drinking 2 L/day for a number of the pollutants listed in Table 5-8. For the fastest penetrating chemicals the dermal dose was predicted to exceed the ingested dose by about two orders of magnitude. This seems counterintuitive and raises concerns that the model may be overly conservative." (NOTE: A few comparison calculations (using benzene and benzo(a)pyrene) suggest that the methodology presented in the 1992 dermal guidance can produce higher absorbed doses that those predicted using methodology in the baseline risk assessment. However, the values were within the same order of magnitude.) With this high level of uncertainty in mind, it is recommended that this issue be addressed in the uncertainty section of the baseline risk assessment for the Naval Submarine Base - New London as follows:

The uncertainty section narrative will acknowledge the methodology presented in the 1992 guidance. The narrative will identify those sites where the risks associated with dermal exposure to contaminants in surface waters and groundwater are currently below (but within an order of magnitude) of EPA risk benchmarks and thus may exceed the benchmarks if the 1992 methodology is used.

Those sites already demonstrating groundwater or surface water risks exceeding EPA benchmarks (HI > 1 or cancer risk estimates > $1x10^{-6}$) using the methodology presented in the baseline risk assessment will not be discussed.

Those sites where maximum organic concentrations in the aqueous media do not exceed Federal Safe Drinking Water Act MCLs will not be discussed. From a practical standpoint, this ARAR is very conservative in light of the potential exposure scenarios envisioned for the Naval Submarine Base - New London and remediation for organics is unlikely if all organics are below MCLs.

Comment 17, p. 3-76, ¶2

It is not appropriate to remove chemicals from inclusion in the risk assessment simply because appropriate toxicity criteria are not readily available on IRIS or HEAST. These chemicals should be carried through

EPA
See followup

the risk assessment and their impacts qualitatively assessed based on information available in the literature or from ECAO. The additive impact to risk from these chemicals must also be addressed.

Response:

KS

As previously discussed, the Navy and its contractors have difficulty obtaining toxicity criteria from ECAO. If such information is requested from ECAO, the first thing they ask is which EPA Region are you working for, which site is it, and can you get the RPM to provide a request. Unlike IRIS and HEAST we can not subscribe to the ECAO values and documentation or request a peer review of toxicity criteria we may develop ourselves. Consequently, we rely on the compilation of toxicity criteria presented in the EPA Region III Risk-Based Concentration Table. We double check the toxicity criteria against available values in IRIS and HEAST and accept the ECAO values presented in the table. (We assume that EPA Region III does have access to the most currently available ECAO values and appreciate the effort expended by EPA Region III to compile and distribute the most current toxicity information available.) It is hoped that EPA Region I will accept the ECAO toxicity criteria presented in the EPA Region III Risk-Based Concentration table in a spirit of cooperation and with an understanding of the difficulty noted in obtaining ECAO values. However, if this is unacceptable and EPA Region I is willing to provide support in obtaining ECAO values for this project, the Navy and its contractors are willing to work with them to use the EPA Region I information.

Regarding compounds that lack toxicity criteria from any available source (IRIS, HEAST, ECAO), the impact on the risk assessment has been qualitatively discussed in the uncertainty section. Given that at least one type of toxicity criteria (reference dose or slope factor) is available for the predominant site contaminants (predominant in terms of occurrence and distribution) and given the fact that CERCLA type risk assessments are designed to be conservative (i.e., they tend to over predict rather than under predict risk), it is unlikely that time and resources expended on the development of new toxicity criteria will significantly alter the major risk results or change the RI conclusions.

Comment 18, p. 3-76, ¶5

See comment for Section 3.3.3.4 above regarding future land use assumptions.

Response:

KS See response to Comment 13.

Comment 19, p 3-77, ¶3

The risk assessment needs to address the potential for receptors to be exposed to multiple sites at NSB and the associated risks.

Response:

KS

It is considered unlikely that a single receptor will come into contact with multiple sites given that 1) military personnel are assigned to specific billets and are associated with one area; 2) civilian personnel work in one area, and; 3) the sites that do constitute some risk are remote from one another. A construction or utility worker could conceivably come into contact with multiple sites. However, if this is the case the exposure frequency and duration at any one site would probably be reduced.

With the information discussed above in mind, a detailed list of input parameters and scenarios for the risk assessment is being prepared and will be submitted to the EPA and CTDEP for approval on July 28, 1995. The EPA is currently investigating new regulations/guidance to determine if more realistic exposure

scenarios should be used in the risk assessment. If any of the new regulations are applicable, they will be used to determine the exposure scenarios to be evaluated in the draft final Phase II RI risk assessment.

Comment 20, p. 3-80, ¶1

The text should state if the literature was consulted prior to extrapolating from a RfC to a RfD in this risk assessment.

Response:

Please see response to comment number 10.

The toxicity criteria presented in Tables 3-4 and 3-7 are the same as those presented in the EPA Region III Risk-Based Concentration table. Most RfD values based on a conversion from RfC were double checked against the source document (IRIS or HEAST) to assure that the conversion was per methodology presented in HEAST. (All will be double checked for the final version of the document.) We accepted for use these converted values (as does EPA Region III) in order to produce the most complete risk assessment (or RBC table) possible. It is hoped that EPA Region I will accept the converted values presented in the EPA Region III Risk-Based Concentration table in a spirit of cooperation. A brief discussion will be added to the narrative regarding the extrapolation from RfC to RfD and the uncertainties associated with the conversion.

KS

Comment 21, p. 4-12, Table 4-3

The hydraulic conductivity testing program conducted during the RI is not sufficient for the purpose of developing an understanding of the hydraulic conductivities associated with the various subsurface hydrostratigraphic units. Given that there are 13 sites and at least five hydrostratigraphic layers (fill, dredge spoils, deep sand layer, shallow silty sand layer, and bedrock), testing of only seven wells is not adequate. It appears that the Navy omitted the Phase I hydraulic conductivity data because it was inaccurate. However, some of the Phase II tests appear to be incorrect as well, and it is recommended that additional tests be conducted in each hydrostratigraphic layer at various locations around the base.

It appears that insufficient water-level changes may have been applied to stress the aquifer in most of the tests, resulting in hydraulic conductivity values that probably represent only the filter pack material surrounding the well screen. In addition, the analysis of recovery for wells 4MW2S and 6MW3D focused on the early portion of the semi-log plot, that represents the filter pack rather than the aquifer.

The nature of the fill material is likely different at each of the different sites, depending on whether the material is landfill solid waste, clean fill, or construction debris, and the nature of the natural materials is likely not homogeneous from site to site. Therefore, additional testing is necessary.

The RI identifies several types of bedrock present at the site, each of which will likely have different hydraulic conductivities. However, no bedrock wells were tested. Although the text indicates that well 4MW2S is screened in bedrock, it is a hybrid well screened across two different hydrostratigraphic layers. Hydraulic testing of a well screened in multiple layers is not meaningful. These data should be omitted and replaced with more accurate and comprehensive testing data.

Well 6MW7S is also screened across two layers (a fill and a sand layer) thereby limiting the value of hydraulic conductivity testing derived from that well.

Lastly, falling head tests were performed in some of the wells screened across the water table (including 15MW1S). Water draining into the unsaturated formation will flow more rapidly than predicted by Darcy's

law. Therefore, the falling head tests conducted in wells with screens that bridge the water table yield distorted type curves that cannot be interpreted reliably.

Response:

JPO

Hydraulic conductivity testing was performed in monitoring wells identified in the approved work plan. The results will be checked and any tests which were performed in wells which monitored several hydraulic units will be qualified and not used for evaluation purposes, if appropriate.

There is no known lower limit of water level changes in a monitoring well which would result in yielding hydraulic conductivity values representative of filter pack material. The rate of rise or fall with respect to time is evaluated after a test to determine if the results are valid. An evaluation of the semi - log plots did not show varying slopes indicative of filter pack influence.

Based on the two scoping meetings which have been held between EPA, CTDEP, and the Navy, it has been agreed that no additional hydrogeologic testing is necessary for the completion of the draft final Phase II RI. The Navy will collect additional hydrogeologic data, if necessary, to support remedial design activities for a FS or as part of a Phase III RI.

The wells were tested in accordance with the approved work plan. It is agreed that wells monitoring multiple intervals provide limited results. As discussed above, the necessity for additional data collection activities will be addressed as part of future investigations.

The hydraulic conductivity testing results will be checked and any falling head tests performed in wells without completely submerged well screens will not be used.

Comment 22, p. 4-13, ¶2

Agreed. The text should indicate that values of specific yield above 0.4 are a typical, and values above 1 are physically impossible. The text needs to discuss the implications of this relative to the accuracy of the other aquifer parameters derived from the pumping test.

Response:

JPO

The text will be revised to indicate that values of specific yield above 0.4 are a typical, and values above 1 are physically impossible. The text will also be revised to discuss the implications of this relative to the accuracy of the other aquifer parameters derived from the pumping test.

Comment 23, p. 4-13, ¶3

Based on the wide variation in water levels noted on Table 4-5 between August and March, a water table map and bedrock potentiometric surface map should also be prepared for the March sampling round to determine the variability on the groundwater flow directions during different seasons. There are some wells that exhibit water level variations as high as 8 feet between the two sampling rounds (*e.g.*, 1MW2S, 2LMW13D, 2LMW8S), while others remain nearly constant or actually increase from March to August (*e.g.*, 2DMW27D).

Response:

JPO
CR

Shallow overburden and bedrock potentiometric surface maps will be prepared using both the March and August water level data.

Comment 24, p. 4-25, ¶1

The last sentence in this paragraph should be clarified.

Response:

JPO Agreed. This sentence will be clarified.

Comment 25, p. 4-46, ¶1

The RI states that the Area A Wetland was artificially created, but does not substantiate this statement. There appears to have been an existing wetland present in this area that was extensively altered by the placement of the dredged material. Although the origin of this wetland does not alter the protection that is afforded under the Clean Water Act, the text should be revised to more accurately describe the history of the wetland.

Response:

JPO A history of the Area A Wetland is included in Section 7. Page 4-46, Paragraph 1 will be modified to reference Section 7 for a history of the Area A Wetland.

Comment 26, p. 5-8, Figure 5-3

The water level indicated by the contours on this map (approximately 85 feet) do not match that reported in Table 4-5 on August 23-24, 1994 (79.39 feet).

Response:

CR Agreed. Figure 5-3 will be revised to match data in Table 4-5 for August 23-24, 1994.

Comment 27, p. 5-9, ¶2

The hydraulic gradient which should be used for calculating seepage velocity can be estimated from the groundwater contours on Figure 5-3, and should be approximately 0.5.

Response:

JPO The hydraulic gradient across the site will be re-estimated from revised Figure 5-3 (Comment 26) and will be approximately 0.053. The seepage velocity will be recalculated with the revised hydraulic gradient and will be approximately 0.48 feet/day.

Comment 28, p. 5-9, ¶5

The complete analytical database is not contained in Appendix D.1, only data from Phase II are presented. Phase I data need to be included in the database.

Response:

DW A revised, comprehensive database will be provided in the draft final report. The database will include data collected during Phase I and II.

Comment 29, p. 5-19, ¶2

This section should discuss the mobility of the pesticides that were detected at the site. Page 5-14, ¶3 indicates that concentrations of 4,4'-DDT increase with depth, whereas Section 5.7.1 relies on the fact that the pesticides are "immobile."

See EPA Followup DR p5-14 ¶3

Response:

It is unclear why an increase to 140 ug/Kg at depth is an issue for concern. It is common knowledge that pesticides are relatively immobile except via mechanisms such as surface water and aeolian erosion. The distribution of pesticides at the CBU drum storage area as a function of depth is most likely attributable to reworking of the soil, particularly since this site is located adjacent to the landfill.

Comment 30, p. 5-19, §5.6.1

This section needs to clearly state what data were included in the risk assessment. If Phase I data were not used, this needs to be stated and justification provided for not including the Phase I data. Based on a review of Table 5-3, it appears that the Phase I data should be included in the risk assessment database because several contaminants, such as xylene, selenium, and TPH, were detected at higher concentrations in Phase I soil samples. The complete risk assessment database needs to be provided in this document and this data must be summarized in a table that compares the maximum or UCL for each contaminant to the appropriate Region III screening level. Currently, it is not possible for the reviewer to confirm the COC selection process (see also previous comment for page 3-25, ¶2).

Response:

KS

In the draft Phase II RI report, both Phase I and II soils data were screened however this was not well documented within the text. Please refer to the response to Comments 8 and 9 as to the approach for completing the draft final Phase II RI.

In regards to the contaminants discussed in the comment, the following information was determined. Xylene was detected in soil at 300 ug/Kg during Phase I and 380 ug/Kg in Phase II. Both of these results are multiple orders of magnitude below the screening levels. Selenium was detected in soil at 0.93 mg/Kg during Phase I and was not detected during Phase II. However, the selenium result is also orders of magnitude below the screening level. TPH does not have an EPA screening level and was subsequently not screened. However, CTDEP does have a screening value and it will be used in the draft final RI.

Comment 31, p. 5-20, §5.6.2

The exposure scenarios for this site are not sufficiently protective of human health. A future excavation worker exposure to surface and subsurface soils scenario must be evaluated since development/ construction in this area could occur. In addition, groundwater beneath this site is classified as GA, suitable for drinking water, and should be restored; for example, carbazole and manganese currently exceed the applicable Region III screening level and MCL, respectively.

Response:

KS JFD

The construction worker scenario will be added for the CBU Drum Storage Area site. See response to Comment 14 for further details on the approach to completing the draft final Phase II RI.

Comment 32, p. 5-25, §5.7.3

Groundwater at the site is classified as GA, yet concentrations of carbazole and manganese exceed applicable regulatory criteria or health-based standards. As a result, EPA cannot support the "no further action" recommendation because it may not be sufficiently protective.

Response:

KS
LK

Please see the response to Comment 14 with respect to groundwater use and risks. The source of carbazole and manganese contamination in the groundwater will be evaluated further based on the data which is available. It is possible that the concentrations are naturally occurring but further investigation is necessary to prove this point. A summary of the findings of the investigation will be provided within the draft final RI report.

Comment 33, p. 6-1, ¶2

This section should indicate the possibility that medical and radiological wastes were disposed in the Landfill, as discussed in the Draft Supplemental Initial Assessment Study and the draft final Feasibility Study for the Area A Landfill.

Response:

DR

The draft final Phase II RI will be revised to reflect the findings of the draft Historical Radiological Assessment (HRA) relative to the possibility of "radiological wastes" being disposed of in any former landfill at Subase. As reported in Section 5.2.1 of Volume I of the draft HRA, on-site disposal of solid radioactive waste attributed to the Naval Nuclear Propulsion Program (NNPP) has been prohibited since the inception of the Program. Based on records, established policy, and interviews, the potential for NNPP radioactive material having been disposed of on-site is considered to be effectively zero. The possibility of general radioactive material (G-RAM) having been disposed of on-site is addressed in Section 5.2.3, page 5-6, of draft HRA Volume II: "Although unlikely, given what is known about the material used for fill, small amounts of G-RAM incorporated in consumer products (e.g., radioluminescent exit signs, smoke detectors, etc.) could have been disposed of with other industrial material in the DRMO, Area A Landfill, or Goss Cove areas." It is not expected that the potential for G-RAM radioactivity in these former landfills would vary substantially from that in commercial landfills due to normal civilian use.

Comment 34, p. 6-19, ¶5

This section needs to present a map showing which wells were involved in the pumping test, and a map showing the pre- and post-testing water level elevations in the overburden and bedrock.

Response:

CR

Figure 6-4 will be revised to show the shallow wells which were involved in the pumping test. Figures 4 and 5 (i.e., newly created large scale figures showing shallow overburden potentiometric surface) will show the locations of the wells and the figures will be referenced in the text. The following revisions will be made to the text of paragraph 5 on p. 6-19. All wells included in the pump test will be discussed. The test results which are included in Appendix C.4 and Table 4-4 of Section 4.6.2 will be referenced as well as a more detailed discussion of the test which is presented in Sections 2.4.5.3 and 4.6.2.

JP

Maps showing pre- and post-testing water level elevations in the overburden and bedrock will not be created. A total of five (5) wells were continuously monitored during the pumping test. Distances between the pumping well and observation wells ranged from 10 feet (2LOW1S) to 100 feet (2LOW4S). Drawdown

JPO

and recovery curves for these wells are shown in Appendix C.4 and will be referenced in the text. The maximum drawdown occurred at the pumping well (2LPW1S) and was 3.2 feet. Drawdown at the observation wells ranged from 0.37 feet (2LOW1S) to no change (2LOW1D). Therefore, due to the areal coverage of the pumping test and the small variation of drawdowns which occurred due to the test, the creation of maps showing pre- and post-testing water level elevations would not provide additional information which would be useful for characterizing the sites hydrogeologic conditions.

Comment 35, p. 6-31, Table 6-4

This table, and similar tables for other sites, lists radionuclides as detected in site media, but radionuclide contamination is not addressed in the risk assessment. Risks from exposure to radionuclides must be assessed and the additive impact on a potential receptor's total risk must be evaluated.

Response:

DR

Table 6-4 contains the Phase I summary data for the Area A Landfill, which, as noted in the response to the general comment on "Radiological Data" in the forwarding section, did not include radionuclide specific analyses. Table 6-6 contains the summary data for Phase II, Round 2 sampling at the Area A Landfill. The text, this table, and comparable text and tables for other areas where radionuclide-specific analyses were performed, will be revised in the draft final Phase II RI report to reflect the results of such analyses. The only radionuclide identified during the Phase II, Round 2 sampling was the naturally-occurring potassium-40. It is not appropriate to include natural background radioactivity in the risk assessment.

Further, it would not be appropriate to combine radioactive and non-radioactive theoretical risks:

KS

- They are derived differently, with different types of conservative considerations factored in, and are hence different even though they share use of the word "risk."
- Draft and proposed EPA and NRC radiological cleanup criteria are consistent with the above, in that they consider radiological standards independent of any chemical considerations.
- Existing EPA and NRC exposure limits, such as EPA's drinking water limit, represent risk levels in excess of 10^{-4}. These levels are acceptable since they are a fraction of the variability in natural background radiation, and since they do not represent any real, measurable risk, yet these levels are above those used for chemicals.
- "Acceptable" radiological risk levels would likely be a measurable fraction of natural background, as currently being considered by the NRC and EPA. These would be far greater risk levels that one might find acceptable for chemical risk, since high natural background levels are rare for most chemicals of concern. If radiological and non-radiological risks were to be added together, either a total allowable risk number which is too high would result (i.e., potentially masking chemical issues of concern, which is non-conservative), or a total allowable risk number too low would result (implying a technically unreasonable and costly cleanup standard for radioactivity).

Comment 36, p. 6-38, ¶6

Again, all data, from both Phases I and II, need to be presented so that the COC selection can be confirmed. Currently, it is not possible for the reviewer to readily confirm that the appropriate COCs and exposure concentrations were selected for evaluation in the risk assessment.

Response:

KS DR DW

Refer to response to Comment 9.

Comment 37, p. 6-40, §6.6.2 & p. 6-45, §6.7.3

The groundwater beneath the Area A Landfill is classified as GA. In addition, as stated on page 6-44, several organics, including benzene and PCBs, and some metals, including cadmium and lead, were detected at concentrations exceeding regulatory criteria or health-based standards. As a result, the groundwater monitoring proposed in Section 6.7.3 may not be sufficiently protective. The need to remediate groundwater needs to be assessed more fully.

Response:

JPO KS LK DR

Refer to response to Comment 14.

Comment 38, p. 6-45, ¶3

Until the Navy can demonstrate that bedrock groundwater is not flowing toward any residences, it is not reasonable to recommend no further action for the groundwater. For example, groundwater appears to be flowing southeast from well 2LMW17D to 2LMW18D (the most contaminated well) that is toward the nearest residential well, located 1000 feet away. Given that bedding also strikes southeast in this area, it is very possible that groundwater flow in the bedrock is highly anisotropic, and might possibly flow east, off site.

A pumping test of the bedrock aquifer is recommended to evaluate the anisotropy in bedrock. A separate map of the bedrock potentiometric surface also needs to be prepared.

Response:

CR

Water level measurements will be taken from residential wells or temporary wells along Route 12 to verify groundwater flow directions. A potentiometric surface map will be created from this data.

JPO

Based on the two scoping meetings which have been held between EPA, CTDEP and the Navy it has been agreed that no additional hydrogeologic testing is necessary for the completion of the draft final Phase II RI. The Navy will collect additional hydrogeologic data, if necessary, to support remedial design activities for a FS or as part of a Phase III investigation.

CR

Site-wide bedrock groundwater potentiometric surface maps will be prepared using both the March and August 1995 comprehensive groundwater levels.

Comment 39, p. 7-18, ¶4

The alluvial deposits that underlie the remnant topsoil are not depicted on the site cross sections. The text should indicate the thickness of this unit, the lateral extent, and whether this unit is a separate hydrostratigraphic layer.

Response:

CR JPO

The alluvial deposits are indicated on cross sections E-E' and F-F' as the sand and gravel/sand and silt units underlying the dredge spoils unit. These units will be labeled on the cross sections as alluvial

JPO deposits. The text will be revised to include the alluvial deposit thickness, lateral extent and whether the unit is a separate hydrostratigraphic layer.

Comment 40, p. 7-24, Table 7-3

Explain why radionuclides were not analyzed in Phase II groundwater although they were in Phase I.

Response:

DR Radionuclides were specifically analyzed in Phase II groundwater samples. As explained earlier, gross radioactivity was analyzed for in Phase I but specific radionuclide analysis was not performed until Round 2 of Phase II. Table 7-3 contains the Phase I summary data for the Area A Wetland, which, as noted in the response to the general comment on "Radiological Data" in the forwarding section, did not include radionuclide-specific analyses. Table 7-5 contains the summary data for Phase II, Round 2 sampling at the Area A Wetland. The text, this table, and comparable text and tables for other areas where radionuclide-specific analyses were performed, will be revised in the draft final Phase II RI report to reflect the results of such analyses.

Comment 41, pp. 7-29 & 7-30

The notations in Table 7-6 regarding the cadmium results are misleading. The dash would appear to indicate non-detect. However, Appendix D.3 indicates cadmium was not analyzed. In addition, the zinc result shows 27.7 mg/L as a total concentration and 334 mg/L as a dissolved value. Review of Appendix D.3 shows these two values are from the same sample. It would be impossible to have more of a dissolved fraction than total from the same sample. Clarification is recommended.

Response:

DR Cadmium was analyzed but was not detected and hence was eliminated from the database for this site. The draft final Phase II RI database will be revised to include all detects and nondetects. The cadmium results will be included in the revised database. Upon examination of the data it is apparent that the total and dissolved zinc results for sample 2WSW6 were transposed. Tables 7-6 and 7-8 will be amended to reflect these changes as well as Appendix D.3.

The revised maximum metals concentrations were less than the Region III COC screening levels, except that of manganese. The risk associated with manganese will be recalculated. The risk estimate is not expected to change significantly as the maximum concentration was 1.86 mg/kg and was revised to 1.87 mg/kg.

Comment 42, p. 7-31, ¶1

The RI presents surface water concentrations of cadmium and manganese in units of μg/kg. The correct units should be μg/L.

Response:

DR The erroneous units will be corrected.

Comment 43, p. 7-31, 3rd ¶

Current surface water data from Area A must be assessed and discussed with respect to the likelihood for ecological risk in the wetlands by comparing contaminant concentrations to Ambient Water Quality Criteria ("AWQC") and normalizing the criteria based on location-specific hardness concentrations. In addition, it is necessary to include information on frequency of detection, average and maximum concentrations and sampling location in relation to the potential exposure pathways for this assessment.

Previous ecological concerns regarding potential risk from surface water quality was because of elevated cadmium levels. Cadmium data is missing from Appendix D.3. The original analyte list included the analysis of all Target Analyte List ("TAL") metals. This same concern is relevant to location 2WSW11 which is the only surface water data for the Area A wetland pond. As the only surface water body in this area, this pond should be an important point of the discussion.

Response:

KT

A Base-wide Ecological Risk Assessment (BERA) will be prepared and included in the draft final Phase II RI. The outline for the BERA was submitted to the EPA on June 29, 1995. Conceptual models including exposure routes will be submitted to the EPA for approval August 21, 1995. The concerns of this comment on the Area A wetlands ecology will be addressed in the BERA.

DW

The missing cadmium data will be included in the revised database. The ecological concerns due to the cadmium results will be addressed in the BERA.

Comment 44, p. 7-36, 4th ¶

According to Table 7-7, lead was found in a subsurface soil at 298 mg/kg. Note 3 at the bottom of the table does not include location 2WSD9, which is stated in this paragraph as the location of this lead concentration.

Response:

DR

The sample designation (2WSD9) in this paragraph is a typographical error. The lead concentration of 298 mg/kg corresponds to subsurface soil sample 2WMW6S-0204. The text will be revised to ... "The highest concentration of lead (298 mg/kg) was found in sample 2WMW6S-0204."

Comment 45, p. 7-37, §7.6.1

This section needs to clearly state whether or not Phase I data were used in the risk assessment, and provide justification for not using any Phase I data (*see* previous comment for Page 3-25, ¶2). It is important to note that certain metals (*i.e.*, boron, cadmium, and chromium) were detected at higher concentrations in Phase I surface water samples than in Phase II. In addition, many organics detected in sediments collected during Phase I were either not detected or not analyzed in Phase II samples.

Response:

DW
DR
KS

A revised database will be included in the draft final Phase II RI report (See response to Comment 8). The database will include both Phase I and II data. The draft final risk assessment will evaluate both Phase I and Phase II data and will include justifications for elimination of any data. The justifications will be included in the text or as footnotes in the database appendix.

DR
KS

It is likely that a similar approach to evaluation of data as the one used in the draft risk assessment will also be used in the draft final risk assessment. The sediment samples collected during Phase II were analyzed for pesticides only. No sediment samples were analyzed for volatile or semivolatile organic compounds during the Phase II investigation. Sediments collected during Phase I were analyzed for volatiles, semivolatiles, and pesticides/PCBs. These Phase I sediment results were considered and used in the Phase II RI risk assessment. The maximum concentration of pesticides (i.e., either Phase I or Phase II) was used for screening. The volatile, semivolatile and pesticide/PCB compounds detected were screened against Region III COC screening levels and those that exceeded the criteria were retained. The text will be clarified.

Comment 46, p. 7-39, §7.6.2

The exposure assessment for this site should include an evaluation of exposures as a result of future excavation or utility work. The child recreational user may not be sufficiently conservative to protect all potential receptors.

Response:

KS

This exposure route will be added since it is likely that construction workers could be exposed during construction of the cap on the adjacent landfill. Refer to response to Comment 12.

Comment 47, p. 7-43, ¶5

The RI needs to develop a background value for manganese concentrations in surface water. The fact that manganese is present in other surface water bodies, is not sufficient to conclude that the concentrations observed in the Area A Wetland are naturally occurring.

Response:

DW
KS
LEK

Limited background manganese surface water data exists from the Phase I and Phase II RI efforts. This data will be compiled with the Downstream/OBDA reference area surface water data collected during the ecological sampling to develop a background range of surface water manganese concentrations.

Comment 48, p. 7-43, §7.7.2

This section needs to state whether or not any detected groundwater contaminants exceed applicable criteria or health-based standards. In addition, because Area A Wetland groundwater is classified as GA, future risks from routine contact need to be assessed.

Response:

KS
JFO

A quantitative evaluation of the risk associated with groundwater contamination will be included in the draft final Phase II RI. Refer to the response to Comment 14.

Comment 49, p. 7-43, §7.7.3

Demonstrate that the presence of manganese is attributable to dredged material by providing the concentration of manganese in dredged material.

Response:

LEK The solid matrix in the Area A Wetland is dredged material. Hence the concentration of manganese in the Area A Wetland is the concentration of manganese in dredged material.

Comment 50, p. 8-11, 3rd ¶, last sentence

Concentrations of PAHs are found in Figure 8-5, not 8-4.

Response:

DR This typographical error will be corrected.

Comment 51, p. 8-17, ¶5

It should be clarified whether the statement, "...although no metals were found to exceed drinking water standards" refers to filtered or unfiltered samples.

Response:

DR The text has been revised to read as follows: "Concentrations of iron and manganese exceeded the secondary MCLs in both the filtered and unfiltered samples. Sodium results exceeded the DWHA in both filtered and unfiltered samples. Additionally, the concentration of antimony in the filtered sample 2WCGW3S exceeded drinking water MCL. All other metals detected in these samples were present in concentrations below drinking water standards."

Comment 52, p. 8-19, Table 8 4

Again, an explanation should be provided as to why radiological contaminants were analyzed in Phase I groundwater samples but not in Phase II.

Response:

DR Radionuclides were specifically analyzed in Phase II groundwater samples. As explained earlier, gross radioactivity was analyzed for in Phase I but specific radionuclide analysis was not performed until Round 2 of Phase II. Table 8-4 contains the Round 1, Phase II summary data for the Area A Weapons Center, which, as noted in the response to the general comment on "Radiological Data" in the forwarding section, did not include radionuclide-specific analyses. Table 8-5 contains the summary data for Phase II, Round 2 sampling at the Area A Weapons Center. The text, this table, and comparable text and tables for other areas where radionuclide-specific analyses were performed, will be revised in the draft final Phase II RI report to reflect the results of such analyses.

Comment 53, p. 8-37, §8.7.2 & §8.7.3

Several metals were detected in groundwater above MCLs at the Area A Weapons Center. Since this water is classified as GA, further actions at this site should include methods to prevent future exposure to contaminated groundwater.

Response:

KS JFO Please see the response to Comment 14.

Comment 54, p. 9-43, ¶2

The RI states that elevated levels of pesticides within the lower pond may be attributed to past application of DDT and the subsequent runoff and accumulation from surrounding areas. The lower pond appears to have a very small watershed and significant runoff to this pond is not likely under existing conditions. In addition, elevated concentrations of pesticides were not detected in adjacent surface soil samples. Additional justification is warranted to support the position that surface water runoff contributed to the elevated pesticide concentrations present within the lower pond.

Response:

DR In retrospect, and based upon an additional site visit, it has been concluded that overland flow from other downstream watercourses or the Area A Wetlands is probably not responsible for the high concentrations in the lower pond. It was determined that the most significant recharge to the lower pond comes from groundwater. Based on the adsorption characteristics of DDT it is unlikely that groundwater is the source of the contamination. Therefore, this paragraph will be changed to read that the presence of DDT and metabolites is most likely attributable to direct application of DDT in the pond for mosquito control prior to the ban of this substance.

Comment 55, p. 9-48, ¶5

North Lake is used for swimming by base residents. Therefore, exposure of a child resident via swimming in North Lake on a regular basis needs to be assessed.

Response:

KS It is recognized that child residents may swim in North Lake on a regular basis. This information was considered during the development of the exposure scenarios for the Phase II RI. Exposure was assumed to occur at a frequency of 55 days/yr (11 weeks/yr, 5 days/week). This value, which was also used in the Phase I RI, is considered to be a conservative estimate of the exposure frequency since residents are expected to swim during the summer months only (June through August) primarily because of inclement weather. It should be noted that the major source of water for North Lake during the summer months when it is used for swimming is potable water.

A detailed list of input parameters and scenarios for the risk assessment is being prepared and will be submitted to the EPA and CTDEP for approval on July 28, 1995. The EPA is currently investigating new regulations/guidance to determine if more realistic exposure scenarios should be used in the risk assessment. If any of the new regulations are applicable, they will be used to determine the exposure scenarios to be evaluated in the draft final Phase II RI risk assessment.

Comment 56, p. 9-49, §9.6.3

The potential for a single receptor to come into contact with contaminants located at all four locations needs to be evaluated and the potential risk resulting from the additive exposure to all four locations needs to be assessed.

Response:

KS If a receptor were to come into contact with all four areas, it seems appropriate that the exposure frequency at any one of the areas should be decreased by a factor of four. If this is the case, the end result is the same. The cumulative risk from all four areas will not exceed the maximum risk predicted for one area. Therefore, it is recommended that no further action is necessary in response to this comment. With this information in mind, a detailed list of input parameters and scenarios for the risk assessment is being prepared and will be submitted to the EPA and CTDEP for approval on July 28, 1995. The EPA can address their concerns on the appropriateness of evaluating a single receptor coming into contact with multiple locations in their comments on the list.

Comment 57, p. 9-53, ¶2

When the ecological data collection efforts and risk assessment are completed, this section should also include the ecological risk assessment results.

Response:

KT A Base-wide Ecological Risk Assessment (BERA) will be prepared and included in the draft final Phase II RI. The outline for the BERA was submitted to the EPA on June 29, 1995. The BERA will evaluate all ecological data collected to date. Conceptual models including exposure routes will be submitted to the EPA for approval August 21, 1995. The final format (i.e., separate volume or site-specific sections) of the BERA in the draft final Phase II RI report has not been determined. The format will be determined during subsequent meetings between the EPA, CTDEP, and the Navy. The EPA will be given the opportunity to comment on the BERA format during these meetings.

Comment 58, p. 9-53, ¶3, 1st sentence

This sentence is not correct. Actually, the risk assessment was unable to satisfactorily demonstrate the lack of risk. As a consequence, further study was recommended.

Response:

EK This paragraph will be revised to indicate that, in general, no significant risks were determined for human receptors. All incremental cancer risks were within the USEPA target risk range. All Hazard Indices (HIs) for the utility worker were less than unity for the RME and CTE. Although RME HIs for exposure to surface water and sediment slightly exceeded unity for the child resident at Wahoo Avenue and OBDA, these risks are not considered to be "significant" since associated CTE HIs were less than unity.

Comment 59, p. 9-53, ¶3

It is recommended that additional site characterization activities be performed around well 2DMW29S where high levels of vinyl chloride were detected. This finding appears to be unrelated to the downstream watercourses, and may indicate a separate source area. Additional site characterization activities should include interviews and background reviews of the area, possibly a soil gas survey, and additional up- and downgradient well or microwell installations.

Response:

EKS Additional investigation of the vinyl chloride in groundwater was recommended in the draft Phase II RI. Based on the two scoping meetings which have been held between EPA, CTDEP, and the Navy it has

LEK been agreed that no additional site characterization activities are necessary for the completion of the draft final Phase II RI. The Navy will conduct additional characterization activities, if necessary, to support remedial design activities for a FS or as part of a Phase III RI. Recommendations presented in the draft final Phase II RI report will be used to determine the future remedial strategy (i.e., FS or Phase III RI) for each of the sites.

Comment 60, p. 9-53, §9.7.2

The baseline risk assessment needs to consider exposures via swimming in North Lake and routine exposure to groundwater contaminants. Groundwater at the site is classified as GA and several contaminants, including vinyl chloride and lead, exceed MCLs.

Response:

KS Swimmers in North Lake were considered in the risk assessment. Please refer to response to Comment 55 for the proposed approach to evaluating exposure to groundwater contaminants in the draft final risk assessment.

Comment 61, p. 10-8, ¶4

This section needs to indicate whether the overburden is unsaturated, since there does not appear to be any overburden wells.

Response:

JPO The text will be revised to include a discussion of the saturated thickness of the overburden.

Comment 62, p. 10-8, ¶5

There are numerous methods for measuring water levels in artesian wells. One should be selected and used to determine the water level in well 4MW4D. The hydraulic conductivity testing performed in the wells that are screened both in overburden and bedrock are of little value. The limitations of the testing in these hybrid wells need to be indicated in the text.

Response:

JPO The water level data collected in Well 4MW4D will be qualified as being approximate. The hydraulic conductivity test results performed in wells which screen both the overburden and bedrock will be reviewed and discarded if appropriate. In regards to the hydraulic conductivity testing, it should be noted that the hydraulic conductivity testing performed in these wells were done in accordance with the EPA and CTDEP approved Phase II RI Work Plan.

Comment 63, p. 10-9

The groundwater elevation contours on this figure need to be corrected. The water elevation listed in Table 4-5 for wells 4MW4S and 4MW3S are 109.93, and 97.34, respectively. This indicates local groundwater flow to the west, rather than north as depicted in the figure. It is likely that the local groundwater elevation contours bend toward the stream, reflecting groundwater discharge.

Given the number of data points available, and the close proximity of the wells, the minimum acceptable contour interval for this figure is 5 feet.

Response:

CR JPO

Agreed. Groundwater elevation contours for Figure 10-3 will be corrected to match data presented in Table 4-5. However, local groundwater flow is not to the west but to the north-northeast. Wells 4MW2S and 4MW3S are screened in the same intervals, and groundwater elevations of these wells indicate they are cross-gradient, which is supported by groundwater elevations from the other wells at the site. Groundwater elevation contours bend upstream as they approach the stream.

Comment 64, p. 10-10

This section is unclear because surface soil data from the 1994 sampling round is missing from Appendix D.6. While sample concentrations correlating to locations are generally described in terms of maximum concentration at several locations, it is impossible to associate certain locations with specific concentrations. From the 1994 data, the maximum concentrations of some PAHs, arsenic, copper and zinc, indicate exceedances of soil screening values.

The data missing from Appendix D.6 should be provided, and an evaluation of ecological risk should be discussed in light of habitat types and the nature and extent of contamination.

Response:

DW KS DR

Data for the seven surface soil samples (4SS4 through 4SS10) was misplaced (i.e., included with the sediment data) in Appendix D.6. The database will be revised for the draft final RI report and surface soil data will be presented in a separate table of Appendix D.6. The database and tables to be included in the draft final report are the following: a more extensive database which will include Phase I and Phase II data; tables summarizing detections in the Nature and Extent sections; tables summarizing the COC selection process including screening criteria in an Appendix; and in-text tables summarizing COCs and exposure concentrations. In addition to the tables, appropriate text will be provided in the report which summarizes the COC selection process.

DR

A general discussion of PAHs was provided in the Nature and Extent section since numerous PAHs were detected at varying concentrations. The first paragraph on page 10-10 indicates the greatest concentrations of PAHs were observed in samples 4SS5, 4SS7, and 4SS7. Text discussing the Nature and Extent of PAHs will be expanded.

KS DR

It is true that maximum concentrations of several PAHs and arsenic exceeded soil screening values, which is why these chemicals were selected as potential COCs. Chrysene will be added to the list of potential COCs and risks will be reevaluated. Maximum concentrations of copper (30.9 mg/kg) and zinc (412 mg/kg) did not exceed soil screening levels (290 mg/kg and 2300 mg/kg, respectively).

KT

Based on the June 29, 1995 scoping meeting it has been agreed that a BERA will be completed for NSB-NLON and included in the draft final Phase II RI. As part of the BERA, surface soils will be screened against appropriate ecological criteria to evaluate the risk to ecological receptors. The EPA has agreed to determine the sites where this screening is appropriate and to provide the screening criteria. The final approach to evaluating ecological impacts will be determined at a future scoping meeting which will be attended by EPA, CTDEP, Navy and contractors.

See EPA Followup

Comment 65, p. 11-34, ¶2

This section needs to quantitatively evaluate the potential leachability of the VOCs observed in ATB4 and the high lead levels in saturated soils.

Response:

The text, as it was written, incorporated only Round 1 data. Round 2 data, which were included in the risk assessment, will be incorporated into the text. A quantitative evaluation of leachability of the VOCs in a single boring (6TB4) is not considered to be appropriate since only low concentrations of volatiles were detected in up- and downgradient wells (maximum concentration of an individual compound is 8 μg/L, which is 3 orders of magnitude below the soil concentrations). The salinity of the groundwater (dissolved solids) effectively reduces the solubility of organic chemicals, but the limited number of samples precludes a quantitative discussion of this issue.

KS

With respect to lead, no detections were observed in the filtered samples except for 1 sample in Round 1 (2.4 μg/L). Lead was detected in 5 wells (unfiltered samples) at concentrations of 1.6 to 52.7 μg/L in Round 1 only. Lead was not detected in Round 2 at all. Although lead was detected at a maximum concentration of 8130 mg/kg, it does not appear to be mobile in the soil/groundwater matrix under natural (saline) site conditions.

Comment 66, p. 11-42, ¶2

The Interim Action used at this site addressed only the upper three feet of fill material, that extends to a depth of 10 to 20 feet. The remaining saturated soils may be potential sources of groundwater contamination, based on the high VOC and lead concentrations. The revised RI needs to discuss recommendations for further work to evaluate the saturated fill material.

Response:

The draft Phase II RI analytical data does not indicate substantial transport of VOCs and lead soil contaminants to the groundwater. VOCs detected in groundwater during Phase II (Round 1 and 2) consisted of carbon disulfide trichloroethene, 1,2-dichloroethene, 1,1-dichloroethene, and vinyl chloride. Concentrations of these chemicals were relatively low (i.e., less than CRQLs). A single detection of vinyl chloride (5 μg/L) in Well 6MW8S, sightly exceeded the Federal MCL (2 μg/L). Reported levels of the remaining VOCs were less than Federal MCLs. Concentrations of lead in four groundwater samples (6GW2D, 6GW2S, 6GW3D, and 6GW3S) ranged from 25.6 μg/L to 52.7 μg/L. These concentrations slightly exceed the 15 μg/L Action Level for lead.

KS
LEK

It should also be noted that groundwater at the DRMO is not used for drinking water purposes. It is highly unlikely that in the future it would be used for drinking water due to the salinity of the water. Exposure to groundwater via direct contact is only expected to occur if potential receptors are involved in ground-intrusive activities. Groundwater from the DRMO does discharge to the Thames River. The average groundwater discharge rate from the DRMO was estimated to be 5,800 cubic feet/day. The average fresh water flow discharging from the Thames River to the Sound has been estimated to be 222 million cubic feet per day. Therefore, the minimal concentrations of contaminants detected in the DRMO groundwater would be diluted almost 40,000 times after mixing with the Thames River.

Based on the analytical data provided in the draft Phase II RI report (i.e., which show that on a site-specific basis VOCs and lead are relatively immobile) and the dilution affects of the Thames River, further investigation and evaluation of the saturated fill material at the DRMO does not seem warranted. However, the draft final Phase II RI will include and evaluate the findings of the DRMO Interim Action which was not done in the draft report. The need for additional investigation activities will be assessed

KS JPO

base on the findings of the draft final Phase II RI risk assessment. As was discussed previously, sites where there are not additional investigative concerns, as far as the RI is concerned, will be separated from the other sites and be allowed to proceed to a No Action ROD or a FS. Some of the sites which proceed to a FS will likely have additional data needs, but those needs will be addressed as part of the FS. The remaining sites, where there are additional concerns and additional investigations may be necessary to complete the RI, will remain in the RI stage and will move into a Phase III investigation.

Comment 67, p.11-42, §11.7.3

Demonstrate that contaminant levels, specifically lead and PCB levels, that pose unacceptable risk in the risk assessment have been reduced to a level of acceptable risk. Additionally, it is unclear to us why the groundwater contaminants detected at levels above criteria or health-based standards, including lead and boron were not addressed.

Response:

KS LEK

The draft final risk assessment will evaluate different risk assessment exposure scenarios than were included in the draft risk assessment. See response to Comment 14 for further details on exposure scenarios and groundwater issues.

It should be noted that the purpose of the soil removal and encapsulation effort at the DRMO was to eliminate the exposure pathway. Such an action effectively accomplishes the same objective as reducing the contaminant concentration. This information will be used when developing risk assessment scenarios for the draft final Phase II RI.

Comment 68, p. 12-2

This figure needs to indicate the location of the leach fields, and all existing and previous USTs and ASTs.

Response:

CR DR

Agreed. Figure 12-1 will be revised so that leach fields and existing and previous ASTs and USTs are indicated.

Comment 69, p. 12-18, ¶4

A map presenting the soil gas survey results needs to be presented.

Duplicate samples should not be averaged if they do not meet the EPA Region I guidelines for evaluating field duplicate results.

Response:

CR DR

A map will be provided which displays soil gas survey results.

Further discussion between EPA and the Navy and its contractor regarding specific EPA Region I guidelines is necessary.

DW KS DR See EPA Following

Comment 70, p. 12-35, ¶4

The rationale for excluding the Phase I soil data presented in this paragraph is incorrect. The purpose of the baseline risk assessment is to evaluate the risks posed by current site contamination. Data should not be eliminated simply because it was evaluated previously because some chemical-specific risks are assumed to be additive. In addition, a comparison of data presented in Table 12-3 to 12-4 indicates that a number of contaminants were detected at higher concentrations in Phase I samples than in Phase II. Therefore, Phase I soil data must be included in the baseline risk assessment.

Response:

DW KS

A revised database will be included in the draft final Phase II RI report. The database will include both Phase I and Phase II data. The comprehensive database will be used for the baseline risk assessment. Justification for elimination of any data from evaluation in the risk assessment will be provided in the text of the report or as a footnote in the database appendix.

Comment 71, p. 12-42, ¶2

It is unclear why no further action is proposed for this site when the Hazard Index for construction workers and full time employees exceed unity (page 12-39).

see EPA Followup

Response:

KS LEK

The risk assessment is extremely conservative given actual site conditions (e.g., paving and topography) and activity patterns. The exceedences are marginal at worst (e.g., 2.9 for the construction worker under the RME scenario) and is based on multiple exposure routes which are unlikely to occur in reality. If such exceedences are of great concern to the EPA, it is proposed that a recommendation be added that PPE be used at the site under excavation scenarios (e.g., long sleeved shirts and gloves) and that hand to mouth contact be proscribed in accordance with standard health and safety practice (please note that smoking is prohibited at the Torpedo Shops).

Comment 72, p.12-42, §12.7.3

Certain contaminants including bis(2-ethylhexyl)phthalate and arsenic, were detected in site groundwater at concentrations exceeding MCLs. Because groundwater is classified as GA, these exceedances must be addressed. A "no further action" determination may not adequately protect human health.

Response:

KS JPO

Refer to the response to Comment 14 with respect to groundwater use and risks.

Comment 73, p. 13-16, ¶4

This paragraph indicates that the water level elevations are lowest at 8MW1; however, the groundwater contour map in Figure 13-3 indicates that the lowest groundwater levels are at well 8MW5S. It appears that the map needs to be corrected (*see* comment for Page 13-17).

Response:

CR JPO

Figure 13-3 will be corrected to reflect the groundwater elevations presented in Table 4-5. Well 8MW1 has the lowest groundwater elevation in that area.

Comment 74, p. 13-17

Many of the water level elevations are incorrectly interpreted on this map. For example well 8MW6S is contoured as approximately 2.5 feet, while the value listed in table 4-5 is 3.27 feet. Wells 8MW5S, 8MW1, and 8MW4 appear to be incorrectly contoured as well.

This map should be prepared using a contour interval of no greater than 1 foot.

Response:

CR JPO

Figure 13-3 will be corrected to reflect the groundwater elevations presented in Table 4-5. A contour interval of one foot will be used.

Comment 75, p. 13-19, ¶2

It is not appropriate to average the hydraulic conductivities from multiple stratigraphic layers as was done in this section. Separate stratigraphic layers will likely exhibit different hydraulic conductivities. Failure to recognize the significance of different values of subsurface hydraulic conductivities may result in overlooking more transmissive contaminant migration pathways.

Response:

JPO

The context of paragraph 2 on p. 13-19 was to describe the methodology for estimating parameters used to calculate the groundwater discharge rate from Goss Cove to the Thames River. Paragraph 3 on p. 13-19 presents the details of the calculations performed to estimate the groundwater discharge rate. The organization/order of these two paragraphs makes it difficult to understand that the two paragraphs are interrelated. Therefore, paragraph 3 and paragraph 2 will be combined into a single paragraph, with the text of paragraph 3 proceeding the text of paragraph 2, which details the methodology used for estimating groundwater discharge rate.

The average hydraulic conductivity used to calculate the groundwater discharge rate was estimated from hydraulic conductivities for wells completed in one stratigraphic layer (overburden). All of the wells, 8MW1S, 8MW3S, 8MW4S, and 8MW2S, were screened in the overburden at approximately the same interval (6-16 feet). Therefore, hydraulic conductivities from separate stratigraphic layers were not averaged and hydraulic conductivities for the most transmissive unit (overburden) were used to estimate the groundwater discharge rate from the Goss Cove to the Thames River.

Comment 76, p.13-45, §13.6

The text needs to clearly state what sample data were evaluated in the risk assessment. If only Phase II data were used, justification needs to be provided for eliminating Phase I. A review of Table 13-3 indicates that several metals were detected at higher concentrations in Phase I soil samples than in Phase II.

Response:

DW KS

A revised database will be included in the draft final Phase II RI report. The database will include both Phase I and Phase II data. The comprehensive database will be used for the baseline risk assessment. Justification for elimination of any data from evaluation in the risk assessment will be provided in the text of the report or as a footnote in the database appendix.

Comment 77, p. 13-55, ¶2

Prior to conducting a Feasibility Study at this site, additional characterization is necessary. There is insufficient data available regarding the nature and extent of groundwater contamination in the bedrock aquifer. The hydraulic conductivity of the bedrock in the area of Goss Cove and the maximum level of TCE contamination in the bedrock aquifer need to be determined. The TCE concentrations noted in 8MW8D may be indicative of the presence of Dense Non Aqueous Phase Liquids ("DNAPL"). Further investigation will aid in determining the likelihood that DNAPL is or is not present.

Response:

JPO
DR
LEK

Hydraulic conductivity testing was not performed in any of the bedrock wells installed at this site. Tetrachloroethene was detected in Monitoring Well 8MW8D at concentrations of 3,700 μg/L in Round 1 and 5,600 μg/L in Round 2. Based on EPA's guidelines for determining the presences of a DNAPL, it was determined that both of these concentrations indicate the presence of a DNAPL. The results of the evaluation will be summarized in the draft final Phase II RI.

This information on DNAPLs in the Goss Cove area was presented at the June 29, 1995 scoping meeting. It was agreed to at the meeting that additional investigative activities are necessary at this site to determine the extent of the contamination and that the scope of the investigation will be determined at a later date (i.e., after the submittal of the draft final Phase II RI). It is likely that this investigation will take place during either a Phase III investigation or a FS. This information will also be discussed in the draft final Phase II RI.

Comment 78, p. 14-1, ¶2

This section needs to describe all of the individual potential source areas in the Lower Sub Base, and whether they were the focus of this RI, including Building 31, the former incinerator, Pier 33, Berth 16, the Quay Wall, and any other potential or known source areas.

Given the complexities associated with this site, Section 14 needs to be extensively modified to clarify the source areas investigated, sample locations, and analytical results as they relate to specific source areas. As currently presented, the results cannot be related to the objectives of the investigation in this area, and it is not possible to evaluate such recommendations.

Response:

CR
DR

It is agreed that clarification of source areas is needed. A map will be created which shows the known source areas at the Lower Subase. Revisions will be made to the text of this section so that it includes a comprehensive evaluation of all Lower Subase investigations.

Comment 79, p. 14-3

This figure needs to indicate the location of the Building 79 waste oil pit, the Power Plant Oil Tanks, and the Fuel Oil Distribution System, the Fire House/Power House, as well as any other potential source areas.

Response:

CR
DR

These potential source areas will be located on the figure.

Comment 80, p. 14-18, ¶3

It should be noted that the hydraulic conductivity testing performed during Phase I produced data of limited value because of the high permeability of the fill material, inadequate stresses applied to the aquifer, and improper analysis methods.

In addition, it is not appropriate to average all of the hydraulic conductivity data for the site, without regard to the various hydrostratigraphic units.

Response:

JPO

See the response to the hydrogeologic investigation global comment. All the wells used to calculate hydraulic conductivity values were installed in the overburden. Therefore, average hydraulic conductivity data was not averaged without regard to the various hydrostratigraphic units.

Comment 81, p.14-21, §14.4.1

The text needs to clearly indicate whether the analytical results summarized in Tables 14-3 and 14-4 include all sample data from Phase I and Phase II.

Response:

DR

Comparison of the footnotes in Tables 14-3 and 14-4 with the sampling and analysis summaries provided in Tables 14-1 and 14-2 clearly indicates that both Phase I and Phase II soil data were used. A statement clearly indicating this will be included in the text on page 14-21.

Refer to responses to Comments 8 and 9 for further details on the information to be included in the draft final Phase II RI report.

Comment 82, p. 14-49, ¶1

Justification should be provided for not including Phase I soil data. The justification needs to be supported by a presentation of the analytical results from the Phase I soil samples.

Response:

KS

As discussed in the previous response, the Phase I soil data were considered. If a chemical detected during Phase I (but not Phase II) has not been selected as a chemical of concern, it is because it did not exceed the screening level. Text will be added to this paragraph to clarify this.

Refer to responses to Comments 8 and 9 for further details on the information to be included in the draft final Phase II RI report.

Comment 83, p. 14-53, ¶5

The statement that "no one cumulative Hazard Index would exceed unity" should be demonstrated by providing the chemical-specific hazard quotients and associated toxic endpoints, as appropriate.

Response:

KS

This information will be provided in the text on page 14-53.

Comment 84, p.14-57, §14.7

The baseline risk assessment is incomplete because the nature and extent of contamination by semivolatile organic compounds ("SVOCs") is not determined. The semivolatile compounds expected to be present will pose additional risks to potential site receptors. Therefore, their risk to potential receptors needs to be quantitatively evaluated.

See EPA follow up

Response:

No semivolatile organic analyses were completed for soil during either Phase I or II. The analytical suite was determined based on historical usage of chemicals at the Lower Subase and the EPA approved both the Phase I and Phase II work plans. If the EPA had these concerns, it would have been much more appropriate to express them during project planning, not after completion of the draft Phase II RI Report.

KS LEK

In addition, during Phase I, potential PAH concentrations in soil were estimated using TPH data, fluorescence spectroscopy data, and known percentages of PAHs in No. 2 and No. 6 fuel oils which are used at the Lower Subase. These estimated concentrations were used to quantify risks associated with the lower subase in the Phase I RI Report and demonstrated cumulative cancer risks below $1x10^{-6}$ and a Hazard Index below unity.

It was agreed at the June 29, 1995 scoping meeting that no additional data was required for completion of the draft final Phase II RI report. The report will be completed with existing data. All data deficiencies will be identified within the draft final RI report and additional investigative activities will be scoped out as part of a Phase III RI or a FS. Sites will be broken out into a Phase III RI or a FS depending on the findings of the draft final Phase II RI report.

Comment 85, p. 14-58, ¶3

The additional investigations should include a third confirmatory round of groundwater sampling at well NESO11 to determine whether the high metals results were representative.

Response:

LEK KS

Refer to response to Comment 84 for the approach to additional investigations.

Comment 86, p.14-58, §14.7.2 & §14.7.3

The baseline risk assessment is incomplete because SVOCs have not been quantitatively evaluated. It is premature, therefore, to draw conclusions regarding site risks and subsequent remedial actions.

Response:

KS LEK

Please see the response to Comment 84.

Comment 87, p. 15-9

- Surface soil sample (14SS3) data was omitted from Appendix D.11.

Response:

DW KS DR

Sample 14SS3 is included in Appendix D.11 but it is labeled as an OBDANE sediment sample which is incorrect. Sample 14SS3 is a surface soil sample and should be presented along with the other soil samples in Appendix D.11. The page of Appendix D.11 which presently lists sample 14SS3 as a sediment will be deleted and the sample data for 14SS3 will be moved to the page containing the other soil sample data for this site.

Comment 88, p. 15-14, 5th¶

See EPA follow up

The elevated lead concentration could indicate the need for further investigation.

Response:

KS KT

The lead concentration of 403 mg/Kg is not considered of any concern based on the results of the IUBK model. However, the analytical results for this site will be revisited and reevaluated based on the new risk assessment scenarios which are to be included in the draft final RI report. The EPA will be evaluating and approving the risk assessment scenarios and input parameters. Recommendations for further investigative activities will be made based on the results of the draft final RI.

Comment 89, p. 16-10

The groundwater elevation contours do not match the water elevations presented in Table 4-5. The measured elevation in Well 15MW1S (from Table 4-5) is 21.39 feet, while the mapped water level is approximately 26 feet. Similarly, the measured elevation in Well 15MW2S (from Table 4-5) is 21.63 feet, while the mapped water level is approximately 28 feet, Well 15MW3S has a measured water level elevation of 21.03, while the mapped water level is approximately 24 feet, and Well 15MW4S was measured at 21.56 while the mapped water level is about 23 feet. This error is significant because the existing wells appear to indicate groundwater flow to the south, rather than to the west as shown in the figure. The groundwater elevations for this and every site specific map need to be reinterpreted.

Response:

CR JFO

Agreed. The groundwater elevation contours for Spent Acid Storage Area will be corrected to reflect the groundwater elevations in Table 4-5. Groundwater flow is to the south-southeast. Figure 13-3 will be corrected to reflect the groundwater elevations presented in Table 4-5. The groundwater elevation contours for the Spent Acid Storage Area will be corrected to reflect the groundwater elevations in Table 4-5. Groundwater flow is to the south-southeast. In addition, the groundwater elevations for every other site-specific potentiometric surface map will be reviewed and reinterpreted as necessary.

Comment 90, p. 16-29, ¶3

The recommendations for this site should be coordinated with the results of the Post-Sampling Report for the Interim Action at the Spent Acid Disposal Site.

Response:

DR EKR

It is agreed that the results of the Post-Sampling Report for the Interim Action at the Spent Acid Storage Site should be incorporated into the Phase II RI. Recommendations for this site will be made on the Phase II results and the results of the Interim Action Report.

Comment 91, p. 18-8

This section justifies for the comparison of indigenous shellfish from areas around the NSB to either non-deployed ribbed mussels or, in the case of other shellfish, to other areas such as Long Island. Out of necessity, it may be appropriate to compare to other "non polluted areas." However, where possible, comparison should also be made to body burden levels that are indicative of biological stress.

Response:

KT

Data relating body burdens of contaminants in bivalve shellfish to observed stress were reviewed in preparing the draft ecological risk assessment. The data are scant or difficult to apply from one study to another. The chemical concentrations at which stress is observed vary greatly depending on study design. It was therefore concluded that it would be inappropriate, if not impossible, to extrapolate from the literature to the Thames River data. A discussion of this will be added to the draft final report.

A BERA will be prepared and included in the draft final report. The final format of the report has not been agreed upon. The EPA will be involved in the scoping and format of the BERA. It is believed that this issue can be resolved within the BERA.

Comment 92, p. 18-8, 4th¶

The connection between comparison to body burdens from other areas and the potential for bioaccumulation is not clear. A better comparison would include a comparison between body burden levels at NSB and concentrations shown to be detrimental to avian species.

Response:

KT

Shellfish tissue data were compared to body burdens from other areas to demonstrate that bioaccumulation in bivalve shellfish is not occurring in the vicinity of the Subase above that observed in Long Island Sound, in general. Therefore, aquatic birds feeding in the Thames River are not exposed to higher levels of contaminants near the Subase than at other areas where they might feed.

The draft final report will include a comparison of body burdens in native shellfish to concentrations of COCs that produce adverse effects in avian species.

Comment 93, Drawing 4

This map includes data points from several hydrostratigraphic layers and is therefore not very useful. Separate maps need to be prepared for each hydrostratigraphic unit. Several deep wells were used to construct this map should be omitted, including 4MW4D, 2LMW7D, 2DMW16D, 2DMW24D, 7MW3D, 2DMW23D, 2WMW22D, 2WMW5D, 2WMW21D, and many others, including the offsite residential wells completed in bedrock.

The contour interval used for this map should be no more than 10 feet. Finer contour spacings need to be used for the site-specific maps.

A constant contour interval needs to be used for this map. Where necessary, finer spaced contours may be added using thinner lines to identify the contours as having a smaller contour interval.

The map needs to present the areas of unsaturated overburden. The map should also present the locations where the overburden is not present.