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DEPARTMENT OF THE NAVY
NORTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
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IN REPLY REFER TO
5090
Ser 2603\1823\ME
SEP 11 1995

Mr. Mark Lewis
Senior Environmental Analyst
Connecticut Department of Environmental Protection
Bureau of Water Management
Permitting, Enforcement & Remediation Division
79 Elm Street
Hartford, CT 06106

RE: NAVY RESPONSE TO CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION (CTDEP) COMMENTS ON THE DRAFT PHASE II RI REPORT FOR THE NAVAL SUBMARINE BASE - NEW LONDON, GROTON, CT

Dear Mr. Lewis:

Please find enclosed in Attachment A the Navy response to your comments dated June 23, 1995 on the Draft Phase II Remedial Investigation (RI) Report for Naval Submarine Base - New London, Groton, Connecticut.

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

I hope that all outstanding issues the CTDEP 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 funding constraints and 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
Remedial Project Manager
By direction of the
Commanding Officer

Copy to: Ms. Kymberlee Keckler, EPA
Mr. Andrew Stackpole, NSB-NLON
Mr. Matthew Cochran, HNUS - Pittsburgh
Mr. Corey Rich, HNUS - Pittsburgh

Internal copy to:
1823
1822\JD
1831\DM

A.1 RESPONSE TO GENERAL CTDEP COMMENTS

STATE WATER QUALITY STANDARDS AND CLEANUP REGULATIONS

Comment

The Phase 2 RI report recommends No Further Action at several sites where contaminants were detected at concentrations in excess of ARAR or TBC values and/or where risk assessment showed that contaminants posed risks outside the acceptable range. These sites include the CBU Drum Storage Area, The Area A Wetlands, the Area A Weapons Center, the Torpedo Shops, and the Spent Acid Storage and Disposal Area (SASDA). Due to the potential risks posed by these sites, the State cannot support the recommendation of No Further Action at these sites.

The ground water classification for all of these sites except the SASDA is GA, while the ground water classification for the SASDA is GB/GA. A classification of GA means the State considers the site to be a potential source of water for private wells. It is the State's goal to maintain the natural quality of these ground waters. A rating of GB/GA means that while the State recognizes that the ground water may not currently meet GA standards, the State's goal is to restore it to GA quality. Any ground water contamination within GA areas must be remediated to a quality suitable for human consumption without treatment. Contaminated soils must be remediated so that they no longer are a source of pollution to the waters of the State. The proposed Cleanup Standard Regulations identify specific concentrations for pollutants in ground water that the State considers suitable for drinking without treatment. The proposed regulations also identify concentrations for pollutants in soil below which the State considers the soils to no longer be a source of pollution to the waters of the State.

In addition, the State's Water Quality Standards currently apply. The Water Quality Standards were adopted as required by Section 22a-426 of the Connecticut General Statutes. Under Section 5 of the Standards, the State's goal is to maintain drinking water quality in GAA areas and GA areas, and to restore the ground water to drinking water quality standards in GB/GA areas. The standards also specify that chemical constituents in ground water in these areas must comply with the standards of the Public Health Code (Regulations of Connecticut State Agencies §19-13-B102), with advisories of the Department of Public Health and Addiction Services, and with Secondary Standards of the Safe Drinking Water Act. In addition, the Water Quality Standard for Oils and Grease is "None other than of natural origin." These requirements constitute Chemical Specific ARARs (Applicable or Relevant and Appropriate Requirements).

Response

Many revisions will be made to the draft Phase II RI to address EPA and CTDEP comments. Substantial revisions will be made to the human-health and ecological risk assessments. The most important revision to the human-health risk assessment will be the inclusion of appropriate Future Residential Land Use Scenarios. The draft Ecological Risk Assessment will be revised into a Base-wide Ecological Risk Assessment (BERA) which will

encompass all site-specific data collected to date. These revisions will likely impact the recommendations for No Further Action at many of the sites.

It was agreed to at the June 29, 1995 scoping meeting that a detailed list of input parameters and scenarios for the risk assessment would be prepared and 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. All applicable CTDEP Cleanup Standard Regulations for groundwater and soil and Water Quality Standards will be used in evaluating contamination levels at sites.

The CTDEP's classification of the groundwater at NSB-NLON was discussed at two scoping meetings (June 1, 1995 and June 29, 1995). 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.

At the June 1, 1995 meeting, the CTDEP indicated that reclassification of the groundwater is one possible option for the Navy, but it is not guaranteed and the process may take up to one year. The CTDEP indicated at the June 29, 1995 meeting that a variance may be another option for the Navy. The Navy requested that the CTDEP review their groundwater standards and determine procedures for reclassifying the groundwater and for obtaining a variance for groundwater and provide this information to them. The CTDEP responded to the Navy's request by providing them with a draft copy of proposed regulations regarding reclassification of groundwater quality standards (dated August 1, 1995). After review of the proposed regulations and the current base conditions, the Navy feels that it is likely that they will be able to have the groundwater at NSB-NLON reclassified and will attempt to do so once the new regulation becomes final. The CTDEP has indicated that there is a public hearing scheduled for September of 1995 to discuss the new regulation.

The EPA also indicated at the June 29, 1995 meeting 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 for NSB-NLON. The practicality of the Navy pursuing an EPA waiver and reclassification of the groundwater by CTDEP would be contingent upon the Navy's current and future land use at the base and verification that groundwater flow from the base to public wells is not possible.

HYDROGEOLOGIC INVESTIGATIONS

Comment

The State is concerned that the hydrogeologic investigations documented in this report are generally inadequate to establish whether offsite wells and ecological receptors may be

impacted by contamination originating from the base, and do not provide data of sufficient quantity or quality to support Remedial Design studies. This is of concern to the State because of the presence of numerous private wells near the base, particularly to the north and northeast along Route 12.

Numerous discrepancies were noted between water levels plotted on the potentiometric surface maps, and the water level data in Table 4-5. In some cases these discrepancies were significant enough that the actual direction of ground water flow appears to be different from that depicted on the map.

The report does not adequately consider the individual hydrogeologic characteristics of the various stratigraphic units, and in particular, differences between the bedrock and overburden aquifers. Numerous monitoring wells are screened in both bedrock and overburden. In addition, some wells listed in the text as bedrock wells are actually screened either partially or wholly in overburden. Several wells designated as overburden wells in the text actually are screened wholly or partially in bedrock. Table 2-1 lists the stratigraphic unit or units in which each well is screened, and lists the depth to bedrock and screened interval. In several cases the bedrock or overburden designations disagree with the numerical depth information. In numerous cases, the designation of a well in this table as an overburden or bedrock well disagrees with the text discussions on the individual sites, with the well logs in Appendix A, or with both. Several well logs are omitted from the wells, so it is not possible to determine whether these wells are accurately designated.

The potentiometric surface maps do not appear to distinguish wells screened in the overburden from those screened in bedrock. At our meeting on June 1, 1995, Halliburton NUS stated that the maps were based on wells screened in the overburden. However, in several places, the maps show contours which extend into areas which are shown on the maps as bedrock outcrops. It is likely that ground water is present in bedrock at these locations. However, it is likely the potentiometric contours will be deflected to some degree in these locations due to vertical hydraulic gradients between the bedrock and overburden. Separate maps should be drawn for the overburden and bedrock units.

The individual potentiometric surface maps for each site were derived from the larger site wide map (Drawing 4) using cut and paste techniques. The weaknesses of the site wide map are shared by, and in some cases are particularly apparent on the individual site maps. These weaknesses include a contour interval which varies but is generally too large to provide sufficient detail. While it may be appropriate to use a wide contour interval on the site wide map, the individual site maps should use a smaller contour interval which will allow sufficient detail to be distinguished. While different contour intervals may be appropriate on different maps, a constant contour interval must be used on any given map. In general, a contour interval of between 1 and 5 feet would appear to be appropriate for the individual site maps, depending on the degree of potentiometric "relief" on a given map.

Some contours are drawn in areas of the maps where no monitoring wells are present, and thus no water level data is available. The text states that these contours are inferred based upon information regarding depth to bedrock and site topography. While some of these "inferred" contours are shown on Drawing 4 using dotted lines, others are shown using solid

lines. In other cases, contours which are dotted on the base wide map are shown on the corresponding site specific map as solid lines. This implies a level of certainty for these contours which does not in fact, exist. All contours shown on the potentiometric surface maps must be based on accurately measured water level measurements using accepted contouring techniques. Contours should not be shown outside the area covered by the monitoring well network.

Response

Groundwater level measurements were taken at the monitoring wells specified in the Approved Phase II RI Work Plan. It is true that various areas of the base, especially the sides and tops of hills, had a limited number of monitoring wells installed in them. These areas are remote and generally unused by the base and did not warrant investigation due to contamination. Therefore, data was not available for groundwater elevation contouring in this area. However, these areas have a significant impact on the groundwater flow patterns at the base. To evaluate the base-wide groundwater flow patterns, engineering judgement was used to develop a base-wide potentiometric surface map. This information is useful in evaluating the potential for contaminant migration at the base, especially towards the private wells to the north and northeast of the base. It is understood that there were limitations and inadequacies in the map (Drawing 4) presented in the draft Phase II RI; therefore, new base-wide groundwater potentiometric surface maps will be included in the draft final Phase II RI report. The maps will show potentiometric surfaces for the two comprehensive rounds of water level data (March and August 1994) which were collected for both the overburden and bedrock units. Areas which have a limited level of certainty, will still be presented on the maps and will have the groundwater contours consistently shown as dashed lines.

The new base-wide potentiometric surface maps will be consistent with the local potentiometric surface maps created for each site. More detailed and constant intervals will be used on the site-specific maps instead of the larger, irregular intervals used on the base-wide maps. This will allow for sufficient detail to be distinguished on the site-specific maps. At the sites where there is sufficient amount of overburden and bedrock wells, site-specific potentiometric surface maps will be created for both units. Wells which are screened in multiple geologic units will be eliminated from the figures and not used in determining the potentiometric surfaces.

The information presented in Table 2-1 and the text of each section will be checked against the boring logs included in Appendix A, and revised as appropriate, so that the proper information on each well, regarding the stratigraphic unit in which it is completed and the screen interval, is presented correctly. A complete set of boring logs will be included in Appendix A.

MANGANESE CONCENTRATIONS

Comment

Manganese was detected in unfiltered ground water samples at concentrations as high as

9.36 mg/L (Area A Wetlands). This is dismissed as being due to naturally occurring conditions, and/or to the presence of dredge spoils at several sites, particularly the various Area A sites. On this basis, No Further Action is recommended at several sites. However, non-carcinogenic health risks at several of these sites exceed acceptable limits, due largely to high manganese concentrations. The State feels that any site which presents risks which exceed the range requires further action, regardless of whether the source of the risk is anthropogenic or naturally occurring. It is the experience of the Department that manganese concentrations in ground water in Connecticut generally do not exceed 1 mg/L. Concentrations significantly in excess of this value generally indicate that naturally occurring manganese is being mobilized due to a landfill leachate plume, agricultural waste runoff, or other source of reducing conditions. The current Connecticut Department of Public Health and Addiction Services Action Level for manganese is 5 mg/L. This is expected to be revised soon to 0.5 mg/L.

Response

As discussed in the comment, manganese was detected in unfiltered ground water samples at concentrations as high as 9.36 mg/L (Area A Wetlands). It is still believed that the concentrations are likely due to naturally occurring conditions, and/or to the presence of dredge spoils at several sites, particularly the various Area A sites. Further investigations of existing data have been and will be done to determine the source of manganese. This information will be included in the draft final Phase II RI report.

To date, 4 maps showing isoconcentration contours of total and dissolved manganese in overburden and bedrock wells were presented at the June 29, 1995 scoping meeting. Typically, each map showed 4 to 5 regions in Area A and Area A Downstream Watercourses which had manganese concentrations which exceeded 1mg/L (general CTDEP background value) and 5 mg/L (CTDEP Action Level). Similar isoconcentration plots for Iron and pH levels in the groundwater will be done to determine if there is any correlation to the manganese groundwater concentrations. Correlations may indicate that the high levels of manganese in the groundwater may be related to leachate from the Area A landfill. Concentrations significantly in excess of background generally indicate that naturally occurring manganese is being mobilized due to a landfill leachate plume, agricultural waste runoff, or other source of reducing conditions.

In addition to the iron and pH isoconcentration maps which will be created, information on the concentrations of manganese in groundwater will be requested from South Eastern Connecticut Water Authority. This water authority uses groundwater wells to supply public drinking water. The information will be used to determine background concentrations of manganese in groundwater for the local area. Also, the CTDEP agreed at the scoping meeting to investigate their records to determine manganese concentrations in groundwater for areas near NSB-NLON.

As discussed above in response to the comment regarding State Water Quality Standards and Cleanup Regulations, the CTDEP's classification of the groundwater at NSB-NLON was discussed at the two scoping meetings (June 1 and 29, 1995). The classification greatly influences the exposure scenarios and the cleanup goals for the base (including manganese). CTDEP indicated that reclassification of the groundwater is possible but not

guaranteed and the process may take up to one year. The CTDEP indicated that a variance may be another option for the Navy. The Navy requested that the CTDEP review their groundwater standards and determine procedures for reclassifying the groundwater and for obtaining a variance for groundwater and provide this information to them. The CTDEP responded to the Navy's request by providing them with a draft copy of proposed regulations regarding reclassification of groundwater quality standards (dated August 1, 1995). After review of the proposed regulations and the current base conditions, the Navy feels that it is likely that they will be able to have the groundwater at NSB-NLON reclassified and will attempt to do so once the new regulation become final. 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 practicality of the Navy pursuing an EPA waiver and reclassification of the groundwater by CTDEP would be contingent upon the Navy's current and future land use at the base and verification that groundwater flow from the base to public wells is not possible.

Recommendations for sites in regards to manganese contamination will be revised based on the findings of the investigations discussed above and on the success of the Navy's attempt to reclassify the groundwater at NSB-NLON. In addition, recommendations may also be revised if the Navy obtains a waiver on groundwater standards from the EPA.

BACKGROUND METALS CONCENTRATIONS

Comment

In several chapters, metals concentrations detected in soils are compared to background concentrations as determined by the Navy in a report dated July 1994. In some cases the text states that metals concentrations detected are not of concern because they are within the range of background concentrations or do not exceed background concentrations. The State, the Navy, and EPA have not yet reached final agreement regarding specific background concentrations for various metals, and how those background concentrations will be used. For this reason, comparisons should not be drawn to background concentrations unless a disclaimer is included noting that final agreement has not yet been reached.

Response

In order to proceed with the Phase II RI process, the most recent version of the background report (July 1994) had to be used. It was felt that it was better to evaluate concentrations against preliminary background data instead of excluding the background results from the report. It is agreed that the Navy and all regulatory agencies must reach final agreement regarding specific background concentrations for various metals. A revised report on background data, Background Concentrations of Inorganics in Soil, Atlantic, April 1995, was submitted by the Navy to the CTDEP and EPA for approval. To date, the CTDEP has not responded to the Navy in regards to the acceptability of the report. If the CTDEP's and EPA's approval is obtained on the report in time for use in the draft final Phase II RI, the approved background data will be used. If it is not approved, the currently available

information will be used in the RI and a disclaimer will be included noting that final agreement has not yet been reached on the background values.

REPORT FORMAT

Comment

The data tables and figures should be revised to present a more clear and concise picture of the extent of contamination at various sites. In addition, all laboratory data should be included in Appendix C. Numerous samples are omitted from this Appendix. In addition, for many samples, the appendix contains only summary tables, which in some cases omit important information such as the analytical technique used, or the identity of the laboratory which performed the analysis.

The report should make more extensive use of figures to depict the areas affected by various contaminants. These and any accompanying tables should be designed so the reader does not have to wade through the appendices to form an overall impression of the extent of contamination. The present report requires the reader to refer to several different tables and the appendix to determine what analyses were performed on a given sample, and what was detected. It would be useful in any table of analytical data to include a column listing the relevant regulatory criteria, and to use shading or bold type to designate results which exceed those criteria. The present report shows regulatory criteria only for a few samples which were analyzed for TCLP metals.

Response

The draft final Phase II RI Report will be made to be more "user friendly" for 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.

The new database will also include all results, with qualifiers, including detections, nondetects, and rejected analytical data. Detection limits will be provided for all nondetects. 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.

Analytical methods used for Phase II data were provided in the Approved Phase II RI Work Plan and are also in the draft Phase II RI. Section 2.3.2 of the RI summarizes the analytical

procedures and the laboratories used for analysis of soil samples. Section 2.4.3 of the RI summarizes the analytical procedures and the laboratories used for analysis of groundwater samples. It would be redundant and unnecessary to provide this information for each sample in the database. Therefore, a footnote will be included in the database which refers the reader to the appropriate section of the text where the analytical methods and laboratories used are referenced.

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.

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.

A.2 RESPONSES TO CTDEP SPECIFIC COMMENTS

Comment 1, Page ES -4, Section E.2.3

This section should discuss the possibility that a road may be constructed on the Area A landfill. The final RI should also note that leachate collection will be carried out as part of the source control remedy for the landfill. In the third line of this section, the word "encapsulation" should be replaced with "capping".

Response

Final details of the proposed construction/remediation activities at the Area A Landfill are still not available. Therefore, it is premature to commit to presenting a discussion of the road and leachate collection system in the Executive Summary. However, since the draft final RI Report will not be submitted until the Fall of 1995, it is likely that this information will be available at the time of the submittal. The text of the Executive Summary will be revised to include a limited discussion of construction/remediation activities (possible road and leachate collection system, if applicable) to be completed at the Area A Landfill.

The word "encapsulation" will be replaced with "capping".

Comment 2, Page 1-20 Section 1.2.3.9 Background Soils Investigation

This section states that Atlantic Environmental's July 1994 report discussed statistical analysis procedures used to evaluate the background concentration of various contaminants in soil. This report was, in fact, a compilation of analytical data, with no discussion of sample collection methods, or of the statistical methods used to arrive at background concentrations. The Department has recently received an updated version of this report, which contains a more extensive discussion of these topics. This revised report has not yet been reviewed by the Department.

The text states that the background data were used in the Phase II RI. Background concentrations are to be selected by mutual agreement between the Navy, US EPA, and the Department. Since agreement has not yet been reached, it is not appropriate to use them in the Phase II RI unless a suitable disclaimer is included.

Response

In order to proceed with the Phase II RI process, the most recent version of the background report (July 1994) had to be used. It was felt that it was better to evaluate concentrations against preliminary background data instead of excluding the background results from the report. It is agreed that the Navy and all regulatory agencies must reach final agreement regarding specific background concentrations for various metals. A revised report on background data, Background Concentrations of Inorganics in Soil, Atlantic, April 1995, was submitted by the Navy to the CTDEP and EPA for approval. To date, the CTDEP has not responded to the Navy in regards to the acceptability of the report. If the CTDEP's and

EPA's approval is obtained on the report in time for use in the draft final Phase II RI, the approved background data will be used. If it is not approved, the currently available information will be used in the RI and a disclaimer will be included noting that final agreement has not yet been reached on the background values.

Comment 3, Page 1-24 Section 1.2.4.7- D.R.M.O.

The word "capping" should be used in place of "encapsulation" in the sixth line.

Response

The word "capping" will replace the word "encapsulation" in the sixth line.

Comment 4, Page 3-18 Section 3.2.2.6

The text states that under aerobic conditions, DDT may be transformed to DDE, while under anaerobic conditions it may be transformed to DDE. According to the ATSDR May 1994 Toxicological Profile for 4,4'-DDT, 4,4' DDD, and 4,4' DDD (page 89), DDT biotransforms to DDD under anaerobic conditions. Please clarify this statement.

Response

This was a typographical error. The text will be revised to indicate that DDT biotransforms to DDD under anaerobic conditions.

Comment 5, Page 3-21 Section 3.2.3.1 Volatile Organics ¶ 2

The word "surface" should be eliminated from the last sentence.

Response

The word "surface" will be eliminated from the last sentence.

Comment 6, Page 3-21 Section 3.2.3.4 Inorganics

The text states that particles larger than 0.45 microns are not removed from water by filtration prior to analysis. Please clarify this statement.

Response

There was a typographical error in the second sentence of the first paragraph of this section. The sentence will be revised to read as follows "...(> 0.45 microns, which are removed via the filtration step...".

Comment 7, Page 3-23 Section 3.3 Risk Assessment Procedures ¶ 2

The term "COCs" should be defined here where it is first used, rather than in the last paragraph on this page.

Response

The term "COCs" will be defined in Section 3.3 where it is first used, instead of in first paragraph of Section 3.3.1 where it is currently defined.

Comment 8, Page 3-26 Table 3-3 Background Soils Data

This table presents background concentrations for various metals in soil. It is based on data contained in Atlantic's July 1994 report on background soils concentrations. Although the Navy, EPA, and DEP have met to discuss this report, we have not reached final agreement regarding specific background concentrations, or the appropriate use of those concentrations. Until we reach agreement on this subject, it is not appropriate to draw conclusions based on comparison between proposed background concentrations listed in this table, and specific concentrations detected at a particular site unless a suitable disclaimer statement is included.

Response

Refer to Response to Comment 2.

Comment 9, Page 3-55 Figure 3-1 Conceptual Site Model

The flow chart does not include direct contact with surface water as a route of exposure for adult recreational users. Since the Thames River is used for water skiing, boating and other recreational activities, this route should be included in the flow chart and in risk assessment calculations. The direct dermal contact, ingestion, and fish ingestion scenarios should each be included. In Section 17, the risk assessment calculations for an adult recreational user of the Thames are discussed.

Response

Direct dermal contact with surface water, ingestion of surface water, and shellfish ingestion was considered for the Local Resident (adult) - Offsite receptor. Water skiing, boating, and other recreational activities in the Thames River were considered for this receptor. Contact with surface water was not evaluated for an Adult - Recreational receptor because it was not as conservative a receptor as the Local Resident (adult) - Offsite receptor.

Figure 3-1 does show that the Local Resident (adult) - Offsite Receptor was evaluated for all of the appropriate exposure routes. Section 3.3.3.4, fifth bulleted item, gives the description of the exposures considered for the Local Resident (adult). Table 17-6 in Section 17.6 summarizes the estimated risks for the Local Resident (adult) - Offsite

receptor. No further action is necessary for this comment.

Comment 10, Pages 3-58 and 3-59 Section 3.3.3.3 Potential Routes of Exposure

The text states that based on measured water levels and water levels inferred from bedrock topography, no private wells are located down gradient of any source areas. In addition, the text notes that the base is served by a public water supply system. Based on these factors, routine exposure to ground water in a residential setting is eliminated from consideration in the risk assessment calculations. It is inappropriate to eliminate exposure to ground water in a residential setting from the risk assessment calculations for two reasons. First, given the significant limitations of the piezometric surface maps as discussed above under General Comments, it is not possible to state with certainty based on available information that no wells are located down gradient of potential contaminant sources. Second, the ground water classification for much of the base is GA. This means the State considers it a potential source of drinking water, regardless of whether any wells currently exist in the area.

Response

The Navy will be collecting confirmatory water level data to verify the groundwater flow direction along Route 12. Based on the results of the sampling round, it is possible that Navy's current approach of not considering groundwater exposure to off-site residents in the risk assessment calculations will still be acceptable. This logic considers only the groundwater flow direction and not the State groundwater classification system. If, however, the data show a potential migration pathway towards residents, the Navy will have to consider the exposure pathway in the risk assessment.

The CTDEP's classification of the groundwater at NSB-NLON was discussed at two scoping meetings (June 1, 1995 and June 29, 1995). 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.

At the June 1, 1995 meeting, the CTDEP indicated that reclassification of the groundwater is one possible option for the Navy, but it is not guaranteed and the process may take up to one year. The CTDEP indicated at the June 29, 1995 meeting that a variance may be another option for the Navy. The Navy requested that the CTDEP review their groundwater standards and determine procedures for reclassifying the groundwater and for obtaining a variance for groundwater and provide this information to them. The CTDEP responded to the Navy's request by providing them with a draft copy of proposed regulations regarding reclassification of groundwater quality standards (dated August 1, 1995). After review of the proposed regulations and the current base conditions, the Navy feels that it is likely that they will be able to have the groundwater at NSB-NLON reclassified and will attempt to do so once the new regulation becomes final. The CTDEP has indicated that there is a public hearing scheduled for September of 1995 to discuss the new regulation.

The EPA also indicated at the June 29, 1995 meeting 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 for NSB-NLON. The practicality of the Navy pursuing an EPA waiver and reclassification of the groundwater by CTDEP would be contingent upon the Navy's current and future land use at the base and verification that groundwater flow from the base to public wells is not possible.

Comment 11, Page 3-61 Table 3-10 Summary of Receptors by Site

Construction workers should be evaluated as potential receptors at the Area A landfill, since a proposal to construct a road on top of the landfill has been discussed. The Navy has indicated that the road would be constructed after the cap is in place. However, if there is any possibility that the road would be constructed prior to capping, this possibility needs to be evaluated.

Response

It is agreed that the Construction Worker exposure scenario should be evaluated at the Area A Landfill. The Navy prepared a letter dated August 3, 1995 and addressed to the EPA and CTDEP in which the proposed risk assessment exposure scenarios and input parameters for the draft final Phase II RI are summarized. Within this letter it can be seen that the Construction Worker exposure scenario is to be evaluated. The CTDEP should review the information contained in the letter and make any appropriate comments in regards to the risk assessment exposure scenarios to be evaluated in the draft final Phase II RI.

Comment 12, Page 3-71 Ingestion of Shellfish/Fin Fish

Despite the title of this section, ingestion of fin fish is not discussed.

Response

The title of this section will be modified to read "Ingestion of Shellfish." Exposure to fin fish from the Thames River is unlikely and was not evaluated in the risk assessment. This modification is documented in the letter dated August 3, 1995 sent by the Navy to the CTDEP in which the proposed risk assessment exposure scenarios and input parameters for the draft final Phase II RI are summarized.

Comment 13, Page 3-77 Section 3.3.5.2 Uncertainty in Exposure Assessment

This paragraph is awkwardly written and difficult to understand.

Response

If the comment is referring to the first paragraph in this section, it is agreed that the

paragraph is awkward. The paragraph will be revised and clarified in the draft final Phase II RI.

Comment 14, Page 4-10 Table 4-2 Summary of Manganese Concentrations-Groundwater

Manganese concentrations in this table are incorrectly expressed in mg/L.

Response

Agreed. The units should be μg/L. This typographical error will be corrected in the draft final Phase II RI.

Comment 15, Page 4-11 Section 4.6.1 Groundwater Quality and Designations

The text notes that although manganese concentrations across the base exceeded offsite concentrations, "no clear indication of an offsite source (or sources) could be found". The elevated concentrations of manganese are attributed to geologic conditions. This appears to contradict statements elsewhere in the report, where elevated concentrations are attributed to the presence at several sites of dredge spoils which originated in the Thames. It should be noted that naturally occurring manganese concentrations in ground water in Connecticut generally do not exceed 1 mg/l, except in some localized areas. Manganese concentrations significantly in excess of 1 mg/l are generally considered to be an indication that an organic leachate plume or another manmade source of contamination is present. The highly reducing conditions in such a plume can mobilize naturally occurring manganese and other metals. This effect would be enhanced by the presence of manganese rich dredge spoils at numerous locations on the base. It should be noted that the highest manganese concentrations generally were found in the various Area A sites, many of which are potentially affected by leachate from the Area A landfill, and possibly by the dredge spoils underlying the Area A Landfill and Wetlands.

Response

As discussed in the comment, manganese was detected in unfiltered groundwater samples at concentrations as high as 9.36 mg/L (Area A Wetlands). It is still believed that the concentrations are likely due to naturally occurring conditions, and/or to the presence of dredge spoils at several sites, particularly the various Area A sites. Further investigations of existing data have been and will be done to determine the source of manganese. This information will be included in the draft final Phase II RI report.

To date, 4 maps showing isoconcentration contours of total and dissolved manganese in overburden and bedrock wells were presented at the June 29, 1995 scoping meeting. Typically, each map showed 4 to 5 regions in Area A and Area A Downstream Watercourses which had manganese concentrations which exceeded 1mg/L (general

CTDEP background value) and 5 mg/L (CTDEP Action Level). Similar isoconcentration plots for Iron and pH levels in the groundwater will be done to determine if there is any correlation to the manganese groundwater concentrations. Correlations may indicate that the high levels of manganese in the groundwater are related to leachate from the Area A landfill. Concentrations significantly in excess of background generally indicate that naturally occurring manganese is being mobilized due to a landfill leachate plume, agricultural waste runoff, or other source of reducing conditions.

Recommendations for sites in regards to manganese contamination will be revised based on the findings of the investigations discussed above.

Comment 16, Page 4-11 Section 4.6.2 Aquifer Characteristics ¶2

Shallow overburden material is described here as both "very dense" and "stiff". These terms should not be used to describe the same soil. A soil may either be cohesionless or cohesive, but may not be both.

Response

Agreed, both descriptions can not be used for the same soil. The material being described in the text is a silty sand which is a granular soil and should be described as "very dense." The word "stiff" will be removed from the sentence.

Comment 17, Page 4-15 Section 4.6.3.1 General Discussion of Groundwater Flow

The Potentiometric Surface Map (Drawing Number 4) discussed here is based on wells screened both in bedrock and overburden, and in some cases, on wells which are screened in both. A water level measurement from one off site residential well (OSW12) is included in the data used to generate the map, although according to Table 2-2 it is unknown what type of material this well is screened in. This is justified based on the fact that "in most cases, the ground water elevations at well clusters are similar in the bedrock and overburden". However, vertical head differences "greater than several feet" were noted in several bedrock/overburden well clusters. This approach is inappropriate, as it ignores the existence of vertical gradients. Separate piezometric surface maps should be drawn for the overburden and bedrock aquifers.

The contour interval on this map varies between 1 and 50 feet, but is generally 10 feet. This wide and variable contour interval may obscure many locally important variations in the piezometric surface. In addition in some areas of the map, such as northwest of the Torpedo Shops, solid lines are used to depict the water table although no wells are present in the area. It is in appropriate to use solid lines to depict a piezometric contour unless those contours are based on measured data.

Dashed contours were used in areas where no data was available and water table elevations were inferred based on topography and bedrock surface elevations. These contours should be omitted from the map since they provide no useful information.

Comparison between the water levels listed in Table 4-5 and those plotted on Drawing 4 shows several large discrepancies. In some cases, these may cause actual ground water flow directions to differ significantly from those shown on the map.

The weaknesses of this map are particularly apparent when the individual piezometric surface maps for each separate site are examined. These individual maps were derived from the larger site wide map using a "cut and paste" approach. In many cases contours on the individual maps are apparently derived from wells located outside the boundaries of the map. In many cases this makes it impossible to determine what wells were used to derive the contours. Separate water table maps should be drawn for each individual site discussed in the text. Data from wells at adjacent sites can be used a map for a particular site, where warranted. However, each site must be considered on an individual basis.

Response

It is understood that there were limitations and inadequacies in the map (Drawing 4) presented in the draft Phase II RI; therefore, new base-wide groundwater potentiometric surface maps will be prepared and included in the draft final Phase II RI report. The maps will show potentiometric surfaces for the two comprehensive rounds of water level data (March and August 1994) which were collected for the Phase II RI. Four maps will be created including 2 overburden maps and 2 bedrock maps. The 2 overburden maps will be created from only data collected in overburden wells, and similarly the 2 bedrock maps will be created from only data collected in bedrock wells. All data presented on the new figures will be consistent with Table 4-5.

The contour interval on Drawing Number 4 varies between 1 and 40 feet. A same variable contour interval will still be used on the revised potentiometric surface maps. This variable interval is necessary due to the topography of the site. Without them, the appropriate level of detail at various locations of the site could not be shown. For example, along the Thames River, the potentiometric surface only varies by several feet and a 1-foot contour interval was used. In the central portion of the site, where the hillsides are rather steep, a 20-foot contour interval was used. If a constant contour interval was used for the entire site either detail would be lost along the Thames River or there would be too much detail in the hills of the site to the point that the contours could not even be distinguished.

Areas which have a limited level of certainty, will still be presented on the maps and will have the groundwater contours consistently shown as dashed lines. Groundwater level measurements were taken at the monitoring wells specified in the Approved Phase II RI Work Plan. It is true that various areas of the base, especially the sides and tops of hills, had a limited number of monitoring wells installed in them. These areas are remote and generally unused by the base and did not warrant investigation due to contamination. Therefore, data was not available for groundwater contouring in this area. However, these areas have a significant impact on the groundwater flow patterns at the base. To evaluate the base-wide groundwater flow patterns, engineering judgement was used to develop a base-wide potentiometric surface map. This information is useful in evaluating the potential for contaminant migration at the base, especially towards the private wells to the north and northeast of the base.

The new base-wide potentiometric surface maps will be consistent with the local potentiometric surface maps created for each site. More detailed and constant intervals will be used on the site-specific maps instead of the larger, variable intervals used on the base-wide maps. This will allow for sufficient detail to be distinguished on the site-specific maps. At the sites where there is sufficient amount of overburden and bedrock wells, site-specific potentiometric surface maps will be created for both units. Wells which are screened in multiple geologic units will be eliminated from the figures and not used in determining the potentiometric surfaces.

Comment 18, Page 4-46 Section 4.8 Ecology ¶ 2

The term "fowl" typically refers to chickens and related birds, not all types of birds as is apparently meant here.

Response

The most common definition of "fowl" given by Webster's Dictionary is "a bird of any kind." Therefore, the word is used correctly in this sentence and no modifications are necessary in response to this comment.

Comment 19, Page 5-7 Section 5.3.4 Geology

The text notes that wood fragments, bullets, and plastic were encountered at boring 1TB1, while gravel, brick, plastic, and aluminum foil were noted in 1TB2 and 1TB3. On Figure 5-2, 1TB1 and 1TB2 are shown outside the boundary of the Area A Landfill. This suggests that these borings may actually be located within landfill material. This suggests that the landfill boundary depicted on Figure 5-2 requires reinterpretation.

Response

It is unknown if this fill material is independent or part of the landfill. However, due to the proximity of the material to the landfill it is likely that it is part of the landfill. Therefore, it will be assumed to be part of the landfill and the boundary of the Area A Landfill depicted on Figure 5-2 will be reinterpreted. In addition, other figures throughout the RI Report which depict the landfill boundary will be revised to be consistent with the boundary shown on Figure 5-2.

Comment 20, Page 5-8 Figure 5-3

The contour interval on this map is too large to allow any useful conclusions to be drawn from this map.

Response

Agreed. The variable contour interval used on this map is too large and difficult to interpret. The figure will be revised and will show a constant 10-foot contour interval. This interval will provide enough detail to make conclusions on the groundwater flow gradient and direction.

Comment 21, Page 5-16 Section 5.4.1 Nature and Extent of Contamination- Soil ¶ 1

The correct State Pollutant Mobility Criteria for lead is 15 μg/l.

Response

Agreed. The units associated with the criteria presented in the text were mg/L and not μg/l. This typographical error will be corrected.

Comment 22, Pages 5-17 & 5-18 Tables 5-4 & 5-5

Lead is not listed as an analyte in either of the rounds of ground water sampling. Lead is also not shown in the corresponding data tables in Appendix D-1. Since lead exceeded the State's Pollutant Mobility Criteria in at least one soil sample, it should have been included in the ground water sampling program. If lead was sampled for but was not detected in any samples, this fact should be indicated in the Appendix, and preferably also in the appropriate tables within the main body of the report.

Response

Groundwater samples collected in both rounds were analyzed for lead (See Phase II RI Work Plan and Phase II RI Sampling and Analysis Plan). The results were nondetects and were subsequently eliminated from the database in Appendix D-1 and Tables 5-4 and 5-5. In hindsight, it is obvious that this information should have been included in the database. Therefore, a revised, comprehensive database will be created and included in the draft final RI Report. The database will include all nondetects and qualifiers. Since Tables 5-4 and 5-5 were created only to show detections, it is unlikely that they will be revised. However, due to the detections of lead in the soil and TCLP results, a brief description of the groundwater results for lead will be included in the text of Section 5.4.2.

Comment 23, Page 5-25 Section 5.7.3 Recommendations

The Navy recommends no further action at this site. The Department disagrees with this recommendation, and requests that further evaluation of this site be performed. This position is based on two facts. First, possible landfill materials were detected in soil borings within the CBU Drum Storage Area. Second, several metals and contaminants, including lead, carbazole, and manganese exceed Federal or State Regulatory Criteria. The Department agrees with EPA's position on this matter as stated on page 13 of Kymberlee Keckler's comment letter of April 7, 1995.

Response

If landfill materials do exist in the CBU Drum Storage Area, as discussed in Comment 19, then these materials will be dealt with as part of the Area A Landfill site. A site management plan (SMP) will be developed to organize and prioritize activities at the Phase II RI sites. The CBU Drum Storage Area will be included as part of the Area A Landfill site in the SMP.

The Area A Landfill is scheduled to be capped and the CBU Drum Storage Area will be covered by this cap. The cap will eliminate the impact from surface soils at the CBU Drum Storage Area. This new information will be used when determining the recommendations for this site.

Due to requests from the EPA and CTDEP the risk assessment for each site will be revised to evaluate a residential exposure scenario. The proposed revisions to the risk assessment have been submitted to the EPA and CTDEP for review. In addition, the Navy has discussed with the EPA and CTDEP their options regarding waivers and/or variances for the groundwater criteria which must be met at the sites. No formal decision has been made by either agency. Based on this information, it is likely that the conclusions for this site will be revised. However, until the issues of the risk assessment and appropriate groundwater criteria are resolved, it is unknown what the revised conclusions will be.

Comment 24, Page 6-21 Figure 6-4

This piezometric surface map is derived from the site wide map. The 160 foot contour is shown on this map as a solid line, but on the site wide map the same contour is shown as a dotted line.
In addition, the 120 foot contour is shown as a solid line on both maps. However, in the vicinity of Route 12, both of these contours are located outside the area covered by the monitoring well network. Since both of these contours appear to be unsupported by data, they should be eliminated from both maps.

Response

Figure 6-4 was inconsistent with Drawing 4 in the draft Phase II RI Report and some of the contours shown on the figure were unsupported by data. The figure will be revised to only show groundwater contours supported by data. In addition, the figure will only show the potentiometric surface for the overburden. A new figure, Figure 6-5, will also be include in the draft final Phase II RI which shows the potentiometric surface in the bedrock.

In regards to the appropriateness of the inferred contours shown on Drawing 4, see the response to Comment 17.

Comment 25, Page 6-45 Section 6.7.3 Recommendations

The word "capping" should be substituted for "encapsulation". Encapsulation implies that the landfill would be both capped and lined. This is not the case.

The report recommends monitoring of a limited number of monitoring wells. The Department feels that a comprehensive ground water monitoring program must be carried out at the Area A Landfill Site in conjunction with the Navy's plans to cap the landfill and install a leachate collection system. This will allow the effectiveness of the capping/ leachate collection source control remedy to be evaluated. The ground water monitoring program must include, but not be limited to a more complete assessment of the nature and extent of any bedrock contamination and a thorough assessment of whether any off site residential wells may be affected by contamination originating at the Area A landfill.

Response

The word "capping" will be substituted for "encapsulation".

To date, the Navy has not committed itself to installing a leachate collection system at the Area A Landfill. The Navy is currently evaluating the necessity of the collection system. Therefore, the CTDEP should not assume that a system will be installed.

The groundwater monitoring program suggested in the draft RI report was not considered as the final program. It was included to give a general idea of the proposed program using the currently available monitoring wells. The proposed program does consider contamination of the groundwater in bedrock and the migration of contamination from the landfill. The program involved two monitoring well clusters (i.e., an overburden well and a bedrock well) in the landfill and several unspecified downgradient wells in the wetlands and downstream water courses. The Navy considers a groundwater monitoring system for the landfill a prudent measure. The comments made by the CTDEP will be considered when determining the final program design.

Comment 26, Page 7-43 Section 7.7.2 Baseline Risk Assessment ¶ 3

The report notes that manganese is a naturally occurring chemical, and that concentrations detected at the Area A Landfill are similar to those detected in Thames River sediments. While manganese is a naturally occurring chemical, it can be mobilized by the reducing conditions typically found in landfill plumes and other sources of organic contamination. Regardless of its origin, the risk presented by manganese must be evaluated, and if warranted, appropriate remedial measures must be taken.

Response

The risk associated with manganese in the Area A Landfill and Area A Wetland will be evaluated in the draft final RI. If warranted, appropriate remedial measures will be suggested and taken to remedy the situation.

Comment 27, Page 7-43 Section 7.7.3 Recommendations

The State cannot support the recommendation of No Further Action at the Area A Wetlands site. Risk assessment calculations showed that manganese posed an elevated non-

carcinogenic risk to children. The report states that because children could be exposed to manganese at a number of other sites, "access controls or...any remedial efforts whatsoever, are considered of limited effectiveness". In addition, the report does nots state whether contaminants detected exceed Federal or State ARAR levels. As noted by Kymberlee Keckler in her letter of April 7, 1995, the ground water classification at this site is GA. This means the State's goal is to restore the water to drinking water quality. Where this is not possible, deed restrictions or other institutional controls must be implemented to prevent use of the ground water. Deed restrictions would not apply as long as the base remains under Federal ownership. However, they would be required if the United States transfers the base to another person or entity. The Department feels that the existing fence around the wetlands should also be maintained to prevent risks posed by direct contact with contaminated surface water and sediments. In addition, the Area A Wetlands should be included in the surface and ground water monitoring program which will be conducted as part of the Interim Remedy at the Area A Landfill.

Response

Recommendations for the Area A Wetland will be revised based on the findings of the revised risk assessment and data evaluations to be completed and included in the draft final RI Report.

As discussed in responses to previous comments, the appropriateness of the GA classification for groundwater and the associated criteria are in question for NSB-NLON groundwater. Further discussions between the Navy, CTDEP, and EPA are necessary on this subject. Currently all parties are aware of the concern and are investigating options. The Navy maintains that the base will remain under Federal control in the future and industrial cleanup goals are appropriate for the site.

There is a potential for groundwater which passes through the Landfill to discharge into the Wetland. Therefore, it is agreed that the Area A Wetland should be monitored as part of the Interim Remedy at the Area A Landfill.

Comment 28, Page 8-1 Section 8-1 Site Description ¶2

The Weapons Center is listed as Building 424 in this paragraph, but is shown as Building 524 on the accompanying site plan (Figure 8-1) and other overall site maps.

Response

This was a typographical mistake and should be Building 524. The text will be revised in the draft final RI Report.

Comment 29, Page 8-15 Figure 8-4 Potentiometric Surface Map

The 160 foot contour is drawn with a solid line on this map, although it is drawn with a

dotted line on the site wide map (Drawing 4). In the vicinity of well 2WMW1D, the 120 foot contour shown on Figure 8-4 does not match the 120 foot contour shown on Drawing 4. Both of these contours are drawn to the east of Route 12, outside the area covered by the monitoring well network. A number of private wells are located to the east and northeast of the site along Route 12. For this reason, uncertainties regarding ground water flow directions must be resolved.

Response

Please refer to response to Comment 24. Figures 6-4 and 8-4 were identical drawings in the draft RI Report and will be revised in a consistent manner. In addition a new figure, Figure 8-5, will also be include in the draft final Phase II RI which shows the potentiometric surface in the bedrock.

In regards to the appropriateness of the inferred contours shown on Drawing 4, see the response to Comment 17.

The Navy has committed to collecting additional water level measurements to confirm the groundwater flow direction along Route 12. This information will be included in the draft final Phase II RI Report.

Comment 30, Page 8-17 Section 8.4.2 Groundwater

The text states that no metals exceeded drinking water standards in ground water samples. However, according to Table 8-4, manganese concentrations in filtered shallow ground water samples were found to range between 3070 μg/L and 5095 μg/L in the first round of Phase 2 sampling and 2820 μg/L and 6500 μg/L in the second round. The current Connecticut Department of Public Health and Addiction Services Action Level for manganese is 5000 μg/L. This is to be revised soon to 500 μg/L. The US EPA Secondary MCL for manganese is 50 μg/L.
Lead was detected at a concentration of 16.8 μg/L in an unfiltered ground water sample. The USEPA Action Level for lead is 15 μg/L.

"Boron" should be substituted for "boring" in the last sentence of the first paragraph.

Response

Contaminants of Concern (COC) selection tables will be included in the draft final Phase II RI Report. The tables will include the screening criteria and concentrations used to select the COCs. These tables will hopefully eliminate the potential for a contaminant to be in exceedance of criteria and not be identified.

Based on the numbers presented by the CTDEP in the Comment, it is appropriate for a discussion to be included in this paragraph which addresses the limited manganese and lead contamination. The revised risk assessment will also address this concern.

The word "boring" will be replaced with "boron" in the last sentence of the first paragraph.

Comment 31, Page 8-37 Section 8.7.3 Recommendations

Manganese and other metals exceeded drinking water standards in several ground water samples at the Area A Weapons Center. In addition, risk assessments have shown an unacceptable level of non-carcinogenic risk to construction workers. In addition, the ground water classification of this site is GA. For this reason, the State cannot support the recommendation of No Further Action at the Area A Weapons Center. The State recommends that monitoring of surface and ground water be continued at this site. The State supports EPA's recommendation that measures be taken to prevent future contact with contaminated ground water.

Response

See response to Comment 27. The necessity of future monitoring of surface and groundwater will be evaluated and discussed in the draft final Phase II RI Report.

Comment 32, Page 9-1 Section 9.1 Site Description

The Small Arms Range near the corner of Shark Boulevard and Triton Avenue is not mentioned in the site description or shown on Figure 9-1. Has this area been evaluated as a possible source of lead contamination?

Response

The Small Arms Range is not part of the IR Program (Phase II RI) and is not a CERCLA site. Removal of lead contaminated soil from this site has been performed this year (1995) as part of a project to upgrade the range.

The range will be shown on Figure 9-1 and other appropriate figures in the draft final Phase II RI. Data collected during the Phase II RI will be evaluated to determine if lead contamination has impacted media in the vicinity of the range. However, due to the limited data which is available for this area (DRMO is closest Phase II RI site), it is likely that this evaluation will not show any conclusive results.

Comment 33, Page 9-17 Table 9-2 Summary of Sampling and Analytical Program-Phase II RI

This table includes a column for dioxins, yet the table does not indicate that any of the samples from the Area A Downstream Watercourses were analyzed for dioxins. However Appendix D5 indicates that sediment sample 3SD6 was analyzed for dioxins. Although pesticides or herbicides may have been disposed of in the Area A Landfill, or used in other areas, only the Area A Downstream Watercourses site was sampled for dioxins. Please explain the rationale for sampling this area for dioxins while excluding other areas. In addition, Table 9-2 indicates that sediment sample 3SD6 was analyzed for radiological

parameters, yet the radiological results for this sample are not included in the corresponding laboratory data, which is presented in Table D5.

Response

Table 9-2 should indicate that sediment sample 3SD6 was analyzed for Pesticides and Dioxins, but not radiological parameters. The table will be revised.

Sample 3SD6 was analyzed for dioxins based on the Area A Field Sampling Plan identified in the Approved Phase II RI Work Plan and SAP prepared by Atlantic (See Tables 7-20 and 7-21 of the Work Plan). Within these documents, this sample was identified as requiring dioxin analysis because sediment samples from the Phase I RI had detections of dibenzofuran.

Comment 34, Page 9-22 Section 9.3.5 Hydrogeology

Table 2-1 indicates that 6 wells were screened in the overburden and 3 were installed in the bedrock at the Area A Downstream Watercourses/ OBDA site. However, no information is included regarding slug testing or other testing to determine hydraulic conductivity of the overburden and bedrock aquifers. This information should be included, with consideration given to different stratigraphic units which may exist within the overburden and bedrock aquifer.

Response

No wells within the Area A Downstream were tested for hydraulic conductivity during the Phase II RI. Three wells (2DMW16S, 2DMW16D, and 2DMW10D) were tested in this area during the Phase I RI. The validity of the test results for these wells is questionable, however the results can be discussed in this section. The data will be reviewed again and if it is found to be acceptable it will be provided in the draft final Phase II RI.

Currently, the Navy has no plans to conduct additional tests to determine aquifer characteristics in this area. The Navy contends that slug testing is only required where groundwater contamination and potential migration warrant testing. Groundwater is not a media of concern for the Area A Downstream, but if it is determined that it is, the Navy will consider further data collection efforts.

The Navy will only consider collection of additional hydrogeologic data under a Phase III RI or a Feasibility Study. This approach to collecting additional data was discussed at the scoping meeting held on June 29, 1995 between the Navy, CTDEP and the EPA. At that meeting, the CTDEP agreed that additional hydrogeologic data were not necessary to finalize the draft final Phase II RI Report. Further discussion on this matter may be necessary between the Navy, CTDEP and EPA.

Comment 35, Page 9-23 Figure 9-5 Potentiometric Surface Map

The contour interval of this map varies between 7 and 10 feet, but is generally 10 feet. Many locally important details of the potentiometric surface may be obscured by using such a wide contour interval. A constant and smaller contour interval should be used throughout the map.

Response

Agreed. The figure will be revised to show a constant 5-foot contour interval. This interval is one-half of typical interval used previously and should provide a sufficiently detailed potentiometric surface.

Comment 36, Page 9-44 Section 9.4.4.4 Sediment- OBDA

As at other sites within Area A, the report attributes high levels of metals detected here, including manganese, arsenic, lead, cadmium and zinc to the presence of dredge spoils in this area. Although the dredge spoils may be the source of some or all of the metals detected, the mobility of these metals may be enhanced by the presence of landfill leachate. Based on the ground water flow directions shown in Figure 9-5, portions of the Area A Downstream Watercourses could potentially be affected by leachate from the Area A Landfill. During previous visits to this site, I observed orange yellow material suggestive of leachate in some of the watercourses in Area A.

Response

It is true that groundwater from the Area A Landfill flows towards the Area A Downstream Watercourses and the mobility of metals may be enhanced by the presence of landfill leachate. As part of the remedial design for the Area A Landfill, the groundwater seep which discharges into the OBDA Pond will be sampled to determine the quality of the water and the potential that the seep may be a source of contamination. In addition, the analytical data collected during the Phase II RI ecological sampling events in the Area A Downstream Watercourses will be reviewed to determine if leachate from the Area A Landfill may be impacting the watercourses.

As discussed in the comment above, many of the Area A Downstream Watercourses have a orange-yellow material (iron floc) coating their bottoms. However, it is premature to suggest, as stated in the comment, that the presence of iron flock in the Downstream Watercourses is due to leachate from the Area A Landfill. The amount of iron in solution or conversely the flocculation of iron in natural watercourses is dependent on the pH, E_h, temperature, and oxygen levels of the watercourse (Wetzel, R.G., 1975, Limnology, W.B. Sanders Co., Philadelphia, PA.). E_h is the oxidation-reduction potential and it is proportional to the equivalent free energy change per mole of electrons associated with a given reduction reaction (Wetzel, 1975). Therefore, changes in any of these parameters may be the cause of the iron flock.

One likely scenario (Wetzel, 1975) for the cause of the iron floc is as follows: Iron from natural sources or iron from dredge spoils is dissolved in the groundwater under anaerobic

conditions as $Fe(HCO_3)_2$. The groundwater discharges to a surface water body through a seep, is oxidized by bacterial transformations into $Fe(OH)_3$, $FePO_4$ or $FeCO_3$ and then precipitates out of solution as $Fe(OH)_3$ in the surface water body. This phenomena has been witnessed in many off-base locations where there is "hard" water. A similar scenario could be developed for the surface water from the Area A Wetlands since wetlands can typically have zones which are anaerobic.

Comment 37, Page 10-8 Section 10.3.5 Section 9.4.4.4 Hydrogeology

The first paragraph of this section discusses the 5 monitoring wells at this site, states that 3 wells are screened in bedrock, and 2 are screened partially in overburden and mostly in bedrock. This information conflicts with information listed in Table 2-1, and with information listed in the drilling logs in Appendix A-6. According to the drilling logs, only 4MW1S is screened entirely within bedrock. This well is listed in Table 2-1 as a bedrock/ overburden well, and in the text as a bedrock well. According to the drilling logs the top of the screen of well 4MWS is even with the top of bedrock. However, the sand pack for this well projects 1.5 feet above the top of the bedrock. This means that this well is in effect a bedrock/ overburden well. This well is listed as a bedrock well in the text, and as a bedrock/ overburden well in Table 2-1.

The table below summarizes the information from these sources regarding the geologic units in which the wells are completed.

	Information Source		
Well	Text- Page 10-8	Well Logs (Appendix A)	Table 2-1
4MW1S	Bedrock	Bedrock	Bedrock/ Overburden
4MW2S	Bedrock/ Overburden	Bedrock/ Overburden	Bedrock/ Overburden
4MW3S	Bedrock/ Overburden	Bedrock/ Overburden	Bedrock/ Overburden
4MW4S	Bedrock	Bedrock/ Overburden	Bedrock/ Overburden
4MW4D	Bedrock	Bedrock	Bedrock

The presence of several wells which are screened both in overburden and bedrock has several important implications. First, as noted by Kymberlee Keckler in her letter of April 7, 1995, (page xvii), slug testing of wells screened across the water table will result in hydraulic conductivity values which are a composite average of the overburden and bedrock, but do not distinguish the individual conductivities of either unit. Second, since there are no bedrock/ overburden well clusters at this location, it is not possible to determine whether any vertical hydraulic gradients are present between the overburden and bedrock. Third, since there are no wells screened solely in overburden at this location, there is no information regarding the potentiometric surface in the overburden.

Response

Table 2-1 will be changed for well 4MW1S to be a bedrock well. The text will be changed for well 4MW4S to be a overburden/bedrock well because the sandpack above the well screen is located in the overburden.

Groundwater at 4MW4S and 4MW4D is under flowing artesian conditions. Although it could not be measured because the riser pipe is not high enough, it is likely that the groundwater elevation at 4MW4D is greater than at 4MW4S. This would imply an upward gradient of groundwater from 30 to 40 feet bgs (4MW4D) to 4.5 to 14.5 feet bgs (4MW4S).

Because the overburden is thin and the groundwater elevations at 4MW4S and 4MW4D are of a similar magnitude, it is expected that the groundwater elevation in the saturated overburden would have a similar but lower magnitude than the groundwater elevation in the shallow bedrock. The groundwater elevation in 4MW4S is above the ground surface, and it is representative of the sandpacked overburden and screened shallow bedrock. If the hydraulic head in the bedrock is greater than in the overburden, groundwater in the well will flow into any screened or sandpacked overburden until equilibrium is reached. If the groundwater elevation is higher in the overburden than in the bedrock (a downward gradient), then water should be ponding at the ground surface, and it is not.

The estimated hydraulic conductivity at 4MW2S of 3.4 ft/day is representative of the region of saturate overburden and shallow bedrock, which are hydraulically connected. The hydraulic gradient between 4MW4S and 4MW2S of 0.32 is representative of the hydraulic gradient through the saturated overburden and shallow bedrock. Therefore, the estimated groundwater seepage velocity of 3.6 feet/day is representative of the saturated overburden and shallow bedrock. The Phase II RI text does not state otherwise. This discussion can be incorporated into the Phase II RI text for clarification.

Comment 38, Page 10-9 Figure 10-3 Potentiometric Surface Map

A smaller contour interval should be used for this map.

Response

Agreed. The figure will be revised and a constant 5-foot contour interval will be used.

Comment 39, Page 11-15 Figure 11-3 Potentiometric Surface Map

A consistent contour interval should be selected for this map. In addition, it is unclear which wells were used to derive this map, and thus whether this map depicts the potentiometric surface in the bedrock or overburden. Appendix A-7 does not include logs for wells 6MW1S, 6MW2S, 6MW3S, 6MW4S, or 6MW8S, so it is unclear which unit these wells are screened in.

Response

Figure 11-3 will be revised and a constant 0.5-foot contour interval will be used. Only water levels from wells completed in the shallow overburden will be used to create the figure and only these wells will be shown on the figure. The wells to be shown include 6MW1S, 6MW2S, 6MW3S, 6MW5S, 6MW6S, 6MW7S and 6MW8S.

Boring logs for wells 6MW1S, 6MW2S, 6MW3S and 6MW4S were included in the Phase I RI Report prepared by Atlantic Environmental Services, Inc. The boring log for 6MW8S was inadvertently omitted from Appendix A-7 of the draft Phase II RI Report, but will be included in the draft final Phase II RI Report.

Comment 40, Page 11-17 Section 11.3.5 Hydrogeology

The text states that an upward vertical gradient exists at well cluster 6MW2, "which indicates that the bedrock and overburden ground water are discharging to the Thames River." No well log is available in Appendix A-7 for the shallow well in this cluster, 6MW2S. However, according to the well log, the deep well, 6MW2D is screened in the overburden. Since there does not appear to be a bedrock well at this location, the direction of any vertical gradient between overburden and bedrock cannot be determined at this location.

Response

The boring log for monitoring well 6MW2S is included in the Phase I RI Report prepared by Atlantic Environmental Services, Inc. As discussed in the comment, both 6MW2S and 6MW2D are completed in overburden materials. Therefore, the discussion on vertical groundwater flow between the bedrock and overburden units at this well cluster will be eliminated from the text. In its place, a discussion on the rationale for the vertical gradient between these two overburden wells will be presented.

Comment 41, Page 11-41 Section 11.7.1 Nature and Extent of Contamination

The text notes that relatively low levels of contamination are present in the ground water at

the DRMO in comparison to the concentrations detected in soil. This may reflect dilution due to tidal flushing. This suggests that the Thames River may be impacted by this site, although sampling of surface water, sediment, and shellfish from the river have not detected any impact which can be attributed to the DRMO site. Additional work should be performed to evaluate the degree and effect of tidal flushing at the DRMO. This should an estimate of the net flux of contaminants to the river via ground water flow. This should be based on a conceptual model which considers the individual hydrogeologic properties of the different stratigraphic units, including landfill material, overburden, and bedrock.

Response

Additional calculations will be performed to estimate the net flux of contaminants to the Thames River via groundwater flow. Simple mass-flux equations will be used. The calculations will be based on a conceptual model which considers the hydrogeologic properties which are currently available for the different stratigraphic units. Tidal fluctuations will be accounted for in the calculations.

The Navy has no plans to conduct additional tests to characterize aquifer characteristics in this area. However, if the CTDEP considers this characterization necessary the Navy will consider collection of additional hydrogeologic data under a Phase III RI or a Feasibility Study. This approach to collecting additional data was discussed at the scoping meeting held on June 29, 1995 between the Navy, CTDEP and the EPA. At that meeting, the CTDEP agreed that additional hydrogeologic data were not necessary to finalize the draft final Phase II RI Report. Further discussion on this matter may be necessary between the Navy, CTDEP and EPA.

Comment 42, Page 11-42 Section 11.7.3 Recommendations

The text states that capping of the DRMO serves to eliminate any further risks from direct contact with soil or from fugitive dust emissions. However, this remedy does not address ground water. The text recommends "continued ground water monitoring down gradient from the area of volatile organic contamination", together with maintenance of the cap. However, lead and PCBs remain in the landfill at significant concentrations. For this reason, continued monitoring should focus on metals and PCBs, as well as volatile organics.

Since the site is located immediately adjacent to the Thames River, it is likely that a significant portion of the landfill waste is saturated, and is affected by tidal fluctuations. Tidal flushing may account for the relatively low ground water concentrations detected at this site. Although Section 4.6.5 discusses a base wide study of tidal fluctuations on ground water flow, this study did not include the DRMO area. Further information is required regarding the role of tidal fluctuations in contaminant fate and transport at the DRMO. In addition, only one well is known to be installed in bedrock at the DRMO. Existing data need to be evaluated more carefully to determine whether any additional bedrock wells exist at this site. Additional bedrock characterization, including installation of additional wells may be required.

Response

A groundwater monitoring program will be developed for the DRMO as part of the removal action conducted at the site. Residual contamination at the site will be considered when determining the analytes for the program.

The Phase II RI figures and discussion include wells and test borings from the Phase I RI, Phase II RI and Focused Feasibility Study. Wells 6MW5D and 6MW6D are the only bedrock wells. Borings 6TB17 and 6TB18 were also drilled through bedrock. Additional reports will be reviewed to determine if there are other bedrock wells installed at the DRMO.

The Phase II RI discusses previous tidal studies that were performed at the Lower Subase. Information from these studies can be applied to the DRMO, because the tidal fluctuation of the river will be the same and groundwater elevations at the DRMO are similar to the Lower Subase. The estimated tidal range of the Thames River is about 3 feet (slightly greater than 3 feet during Phase I RI and less than 3 feet during the Action Memorandum for Building 31 investigations). The measured groundwater elevations at the upgradient portion of the Lower Subase and DRMO was about 3.8 to 3.9 feet msl in March, 1994 and 3.3 to 3.4 feet msl in August, 1994.

If a groundwater elevation is assumed for the DRMO during high tide, the thickness of the saturated fill can be assessed. The thickness of the saturated fill will be the greatest at high tide. For an assumed groundwater elevation of 3 feet, the thickness of the saturated fill ranges from 0 feet along the eastern portion of the site to 26 feet at 6MW2D along the Thames River. In the east and southeast portions of the site, fill is either not present or is thin and only present in the unsaturated zone. Fill is not present at 6MW5S, 6MW5D, 6MW6S, 6MW6D, 6MW7S, 6TB1, 6TB2, 6TB3, and 6TB11. Fill is present only in the unsaturated zone at 6TB8, 6TB13, and 6TB15. The saturated fill thickness is between 0 and 5 feet in the central, far north, and southwest portions of the site at 6MW1S, 6MW4S, 6MW8S, 6TB4, 6TB5, 6TB6, 6TB7, 6TB9, 6TB18, 6TB22, and 6TB23. The saturated fill thickness ranges from 5 to 10 feet at 6MW3S, 6TB14, 6TB20, and 6TB21. The saturated fill thickness ranges between 10 and 20 feet along the Thames River at 6MW3D, 6TB10, 6TB12, 6TB16, 6TB17, and 6TB19. The saturated fill thickness is 26 feet at 6MW2D (fill was not positively identified at 6MW2S).

It is true that groundwater concentrations may be low due to tidal flushing, however, these concentrations are relevant to the groundwater discharge calculation presented in the Phase II RI report and to an assessment of potential contaminant loading from groundwater discharge to the Thames River.

It was agreed to at the June 29, 1995 meeting that any additional investigations at sites will be conducted as part of a Phase III RI or and FS. The draft final Phase II RI will be completed with the existing information.

Comment 43, Page 12-1 Section 12.1 Site Description ¶3

The discharge location of the shallow sump previously used as a wash down/ blow down area for weapons should be determined. Depending on the location of the discharge point,

additional sampling may be warranted. Also, more specific information needs to be provided regarding the composition of Otto fuel and "high octane alcohol". What specific type of alcohol is this?

Response

It was agreed to at the June 29, 1995 meeting that any additional investigations at sites will be conducted as part of a Phase III RI or and FS. The draft final Phase II RI will be completed with the existing information.

The discharge location of the shallow sump will be determined and included in the draft final Phase II RI.

Otto Fuel II is comprised of Propylene glycol dinitrate (76%), 2-Nitrodiphenylamine (1.5%), and di-n-Butyl sebacate (22.5%). The composition of the "high octane alcohol" is under investigation. The composition of both will be included in the draft final Phase II RI Report.

Comment 44, Page 12-3 Section 12.1 Site Description ¶2

The former waste Otto fuel tank at Building 450 was previously identified as being subject to RCRA closure requirements. Section 20 of the Federal Facilities Agreement specifically identifies substantive RCRA closure requirements as ARARs. To date, the Navy has not submitted documentation to the Department regarding closure of this tank. Additional sampling may be required to document "clean closure" of this tank.

The location of the former underground waste Otto fuel tank, and of current and former above ground and underground storage tanks should be shown on Figure 12-2. The location of the former septic system for Building 450 should also be included.

Response

The former waste Otto fuel tank at Building 450 was not subject to RCRA closure requirements due to the fact that waste was not stored in the tank for more than 90 days. The tank was emptied, cleaned and backfilled. Data was collected to support closure and cleaning techniques were detailed. Closure documentation was not submitted to the CTDEP.

The locations of the former and current Otto fuel tanks, Otto fuel waste water sump, and the septic systems will be included on Figure 12-2 as they were shown in the Phase I RI.

Comment 45, Page 12-6 Section 12.3.1 Topography and Surface Features ¶2

Building 477 is discussed here, however its location is not identified in the accompanying figures. Please revise the figures to include this building.

Response

The figures of Section 12 will be revised so that Building 477 is identified.

Comment 46, Page 12-13 Section 12.3.5 Hydrogeology ¶1

The text states that a downward vertical gradient exists at the 7MW5 well cluster. However, according to Table 2-1 and the well logs in Appendix A-8, well 7MW5S is screened partially in overburden and partially in bedrock. Therefore, although these wells appear to show a downward gradient, no conclusion can be drawn regarding vertical gradients between overburden and bedrock at this location. In addition, the text states that only three wells, 7MW1D, 7MW2D, and 7MW5D were screened in bedrock. However Table 2-1 and the logs in Appendix A-8 indicate that well 7MW4S is installed in bedrock. In addition, well 7MW7S is listed as an overburden well in Table 2-1. However, the borings logs and the depth information in the table show that this well is actually screened in bedrock.

A hydraulic gradient was calculated for the overburden between wells 7MW7S and 7MW3D. Since 7MW7S is actually screened in bedrock, the calculated gradient is of no value. This estimated gradient is applied in the next paragraph to estimate a seepage velocity for the overburden. For this reason the calculated seepage velocity is in error and should be recalculated using more realistic data.

Response

The discussion of the vertical gradient at the 7MW5 well cluster will be deleted.

As stated above, five wells, 7MW1D, 7MW2D, 7MW4S, 7MW5D and 7MW7S, were screened in the bedrock. The text will be revised to reflect this information.

The calculations for seepage velocity presented in the draft Phase II RI are in error since monitoring well 7MW7S is screened in the bedrock. Therefore, a new gradient will be estimated using only wells screened in the overburden and a new seepage velocity will be calculated. The text will be revised to show these new calculations.

Comment 47, Page 12-14 Figure 12-4 Potentiometric Surface Maps

The contours on this map are too widely spaced , and may obscure locally important features of the potentiometric surface. The maps should be redrawn using a more appropriate contour interval. In addition wells 7MW1D and 7MW2S are depicted on the Figure, but are not listed in Table 2-1, and no logs for these wells are included in Appendix A-8.

Response

Agreed. Figure 12-4 will be revised and a constant 2-foot contour interval will be used.

Monitoring wells 7MW1D and 7MW2S were completed during the Phase I RI and the boring logs for these wells are included in Appendix B of the Phase I RI Report prepared by

Atlantic Environmental Services, Inc.. Details of the wells are summarized in Table 2-2 of the Phase II RI Report.

Comment 48, Page 12-15 to 12-17 Table 12-3, and Pages 12-19 to 12-21 Table 12-4

These two tables summarize analytical results from Phase I and Phase II sampling. Both list Total Petroleum Hydrocarbons (TPH) as being detected in some samples. The analytical method used must be specified. Appendix D8 contains tables listing analytical results for individual soil samples. However, these tables do not specify what analytical method was used.

Response

The analytical method used for TPH was EPA-600/4-79-020 Method 418.1 and this method was listed in Section 2.4.3 of the draft Phase II RI Report. A general summary of each analytical method used for each media was included in Section 2.0 of the report instead of listing them in the database or summary tables. This helped to eliminate redundant information being presented. A footnote will be included in the database which refers the reader to Section 2.0 for a description of the analytical methods.

Comment 49, Page 12-18 Section 12.4.1 Soil ¶3

This paragraph, and Table 12-3 compare detected concentrations of various soil contaminants to background values. As discussed above (Page 3-26 Table 3-3), it is not appropriate to draw such comparisons until the Navy, EPA and the State have mutually agreed on specific background concentrations, and how they will be used unless a disclaimer statement is included.

This section does not discuss which borings were drilled in the area of the former waste Otto fuel tanks. High concentrations of TPH were detected in samples from two borings installed as part of the Draft Supplemental Initial Assessment Study (November 1994).

Response

Refer to response to Comment 2.

This section will be revised so that a discussion describing the borings which were drilled in the area of the former waste Otto fuel tanks and the high concentrations of TPH which were detected in samples from two borings installed as part of the Draft Supplemental Initial Assessment Study (November 1994) is presented.

Comment 50, Page 12-31 Table 12-7

This table includes TPH results for Phase II Round 2 ground water samples. As with soil samples, the table and accompanying text do not indicate what analytical method was used

for TPH. Appendix D8 includes laboratory reports for some, but not all ground water samples. These show that some samples were analyzed for Oil and Grease using USEPA Method 413.2, while others were analyzed for TPH by USEPA Method 418.1. The use of Method 413.2 is not indicated anywhere in the text of the report, or in the accompanying tables. It is important to distinguish which method was used to analyze each sample, as the two methods do not necessarily yield results which can be directly compared. Method 418.1 is generally considered more appropriate for use with samples containing hydrocarbons. Method 413.2 will detect oils and greases of animal or vegetable origin, in addition to hydrocarbons. Material of animal or vegetable origin can be removed from the sample prior to analysis by filtering the extractant through silica gel. Most laboratories include this silica gel filtration as a routine part of their Total Petroleum Hydrocarbon Analysis under Method 418.1.

Response

Refer to response to Comment 48.

The analytical results for TPH presented in Table 12-7 were determined by Method 418.1 only. Oils and greases, which are determined by Method 413.2, would have been given a different label if the results were presented in the table. The two results would never be used interchangeably. The lab reports included in Appendix D.8 show 8 miscellaneous parameters which are typically analyzed for. As one can see by reviewing the data, the results from these lab reports are not summarized in Table 12-7.

Comment 51, Page 12-42 Recommendations

The State cannot support the recommendation of No Further Action at the Torpedo Shops. Non carcinogenic risks for several contaminants at this site exceed unity, and several soil and water samples contain contamination which exceeds MCLs, the State's Proposed Soil and Ground Water Protection Criteria, or other ARAR or TBC values. As noted by Kymberlee Keckler in her letter dated April 7, 1995, the ground water classification of the site is GA. This means the State's goal is to restore the water to drinking water quality. Where this is not possible, deed restrictions or other institutional controls must be implemented to prevent use of the ground water. Deed restrictions would not apply as long as the base remains under Federal ownership. However, they would be required if the United States transfers the base to another person or entity.

Response

Refer to responses to Comment 23 and Comment 27.

Comment 52, Page 13-16 Section 13.3.5 Hydrogeology

This section should include a discussion of the role of tidal fluctuations as its applies specifically to the Goss Cove landfill.

Response

A limited discussion on the role tidal fluctuations play on hydrogeology of the site will be included in this section. As discussed in response to Comment 42, the Phase II RI discusses previous tidal studies that were performed at the Lower Subase. Information from these studies will be applied to the Goss Cove Landfill, because the tidal fluctuation of the river will be the same and groundwater elevations at the Goss Cove Landfill are similar to the Lower Subase. The estimated tidal range of the Thames River is about 3 feet (slightly greater than 3 feet during Phase I RI and less than 3 feet during the Action Memorandum for Building 31 investigations).

The Navy does not intend to conduct any tidal studies as part of the draft final Phase II RI. If additional studies are warranted, they will be discussed in the recommendations section for the Goss Cove Landfill (Section 13.7.3). Any further studies would be conducted as part of a Phase III RI or FS.

Comment 53, Page 13-17 Figure 13-3 Potentiometric Surface Map

This map should use a smaller and consistent contour interval. The wide and variable contour interval used in this map may obscure many important features of the potentiometric surface. This is particularly important at the Goss Cove landfill due to the proximity of this site to the Thames River. As at the DRMO, it is likely that there is significant dilution of ground water contaminants due to tidal flushing.

In addition, this map includes the 20, 30 and 40 foot contours on the east side of Military Highway. However, no monitoring wells are located in this area. The corresponding Contours on Drawing 4 are dotted, indicating that they were approximated. These contours should be omitted from both maps.

Response

Figure 13-3 will be revised and a constant 1-foot contour interval will be used to present the groundwater potentiometric surface. The 20, 30 and 40-foot contours on the east side of Military Highway will be eliminated from the figure.

Comment 54, Page 13-55 Section 13.7.3 Recommendations

The State agrees with EPA's position as stated on page 20 of Kymberlee Keckler's letter dated April 7, 1995. Due to the potential for public exposure to contaminants at this site, and the possibility of impacts to the Thames River, the State feels that capping of this site may be required as an interim action, before the RI/FS process is complete. This should be carried out as soon as possible.

Response

After a review of the comments received by the Navy from the EPA on the draft Phase II RI,

it was determined that there was no mention of a cap being required for the Goss Cove Landfill site. Therefore, the CTDEP's reference to the EPA's position on this site is not understood and does not seem correct.

Refer to responses to Comment 23 and Comment 27.

The recommendations sections for all sites will be revised in the draft final Phase II RI based on the findings of the revised risk assessment. The EPA and CTDEP will be reviewing the proposed changes and giving approval on the changes. Any interim actions or investigations which are necessary at the site will be performed as part of a Phase III RI or FS.

Comment 55, Page 14-18 Section 14.3.5 Hydrogeology

This section should include a discussion of the role of tidal fluctuations as its applies specifically to the Lower Base Area.

Response

A discussion of the role of tidal fluctuations as it applies to the hydrogeology of the Lower Base Area was presented in a Section 4.6.5.1 of the draft Phase II RI. The Navy agrees with the CTDEP and will provide a summary of this information in Section 14.3.5.

Comment 56, Page 14-18 Section 14.4 Nature and Extent of Contamination

The text states that four separate areas of contamination have been identified in the Lower Base, including the Fire/ House Power House, Building 20, Bullhead Road, and Building 79. This section does not discuss other areas of contamination identified within the Lower Base, such as lead contamination at Building 31, the Pier 33 and Berth 16/ Former Incinerator areas, and the Quay Wall. Although these areas have been studied separately and are outside the scope of the Phase 2 RI, they should be referenced in the text. It is important that all actual or potential sources of contamination within the Lower Base Area be considered together.

Response

Other areas of contamination identified within the Lower Base, such as lead contamination at Building 31, the Pier 33 and Berth 16/ Former Incinerator areas, and the Quay Wall will be referenced in the text of the draft final Phase II RI Report. However, since these sites are outside of the scope of the Phase II RI the discussion of the sites will be limited.

Comment 57, Page 14-31 Table 14-5, Page 14-32 Table 14-6 and Page 14-37 Table 14-7

As at the Torpedo Shops, these tables do not specify the analytical methods used to analyze surface water, ground water or soil samples for TPH. However, Appendix D9 shows

that some water samples were analyzed by USEPA Method 418.1, while others were analyzed by method 413.2. The concerns discussed above regarding TPH sampling at the Torpedo Shops also apply at the Goss Cove Landfill.

Response

The Tables and Section referenced in this comment are for the Lower Subase site. However, the appendix referenced in the Comment, Appendix D.9, provides the data for the Goss Cove Landfill and not the data for the Lower Base, which is D.10. Also, the last sentence of the comment discusses the Goss Cove Landfill instead of the Lower Base. Therefore, it is unclear what site or appendix the comment is referring to.

Please refer to responses to Comments 48 and 50 for a discussion of TPH results (presentation and applicability).

Comment 58, Page 14-48 Section 14.5 Contaminant Fate and Transport

The report concludes, "based on the absence of any substantial ground water contamination in the Lower Subase" that significant migration of contamination does not appear to have occurred. However, a number of contaminants, including lead are present in soil at levels considerably in excess of the State's proposed ground water protection criteria, and in some cases in excess of the RCRA hazardous criteria. These soils represent a potential source of pollution to site ground water, and to the Thames River. The relatively low concentrations of lead and other contaminants detected may reflect dilution by tidal flushing, rather than immobility of soil contaminants.

Response

With the information available during the Phase II RI, the conclusions presented on migration potential in the report are reasonable. To completely understand contaminant migration and tidal influences at the site would require additional studies. However, further study of the mobility of contaminants and tidal influences at the Lower Base is not within the scope of the draft final Phase II RI. Therefore, if the CTDEP feels that any additional studies are required it is likely that the Navy will complete them as part of a Phase III RI or FS.

Comment 59, Page 14-58 Section 14.7.3 Recommendations

The State agrees that further investigation of the Lower Subase is required because of the many areas where elevated concentrations of lead, TPH and other contaminants were detected in soil samples. This investigation should include a more thorough evaluation of the hydrogeology of the Lower Subase. This investigation should define all potential sources of contamination, including those not addressed in the Phase 2 RI, such as the Building 31 lead remediation, and the Pier 33/ Berth 16 and former incinerator site.

Response

Refer to response to Comment 58.

Comment 60, Page 15-7 Section 15.3.5 Hydrogeology

A ground water seepage velocity is derived using a hydraulic conductivity value which is the geometric mean of dredge spoil and fill material. It is likely that the dredge spoil and fill material have hydraulic conductivity values which are significantly different from one another. For this reason it would be more appropriate to consider the fill and dredge spoil as separate stratigraphic units, and to separately determine the hydrogeologic properties of each layer.

Response

Agreed. However, the hydraulic conductivity value used in the original calculations was determined from data for other sites. No hydraulic conductivity data is available for this site. Revisions will be made to the calculations to ensure that hydraulic conductivity data from separate geological units is used for determining the groundwater seepage velocity. Data from bordering sites will be reviewed again to determine an appropriate hydraulic conductivity value.

Comment 61, Page 15-8 Figure 15-3 Potentiometric Surface Map

Only one monitoring well is shown on this map, so it is not apparent to the reader what monitoring wells were used to derived the contours shown. It would be useful to show a wider area which includes other monitoring wells. In addition a smaller contour interval should be chosen to show the potentiometric surface in greater detail.

Response

Figure 15-3 will be revised to show monitoring wells which were used in preparing the potentiometric surface. In addition a 5-foot contour interval will be used to show the potentiometric surface.

Comment 62, Page 15-23 Section 15.7.3 Recommendations

The State cannot support the recommendation of no further action at this site. Elevated concentrations of arsenic, boron, and lead were detected in some surface samples as discussed on Page 15-14 and shown in Figure 15-15. While this does not appear to represent a major source of contamination, some remediation may be required.

Response

Refer to responses to Comments 23 and 27.

Comment 63, Page 16-10 Figure 16-3 Hydrogeology

Comparison of this map to the site wide potentiometric surface map (Drawing 4) shows that few monitoring wells are located in this area. Much of the area where contours are shown is in fact outside the area covered by the monitoring well network. It is not apparent what information was used to derive these contours. In addition, as Kymberlee Keckler notes in her comment letter dated April 7, 1995, several of the water levels given in Table 4-5 do not match the contours on Figure 16-3.

Response

Figure 16-3 will be revised and a 0.5-foot contour interval will be used to depict the potentiometric surface. Any contours which are inferred will be dashed.

Comment 64, Page 16-11 Section 16.4.1 Soil ¶5

This paragraph compares metals concentrations detected in soils to background concentrations. As stated previously, it is not appropriate to make comparisons to background concentrations until the Navy, the State, and EPA have reached agreement regarding background concentrations, unless a suitable disclaimer is included..

Response

Refer to response to Comment 2.

Comment 65, Page 16-29 Section 16.7.3 Recommendations

Risk assessment shows non-carcinogenic risks to construction workers in excess of the acceptable range, and lead was detected in subsurface soil samples at concentrations in excess of the State's proposed Ground Water Protection Criteria. In addition, during the Removal Action completed at this site in January 1995, only soil containing total lead in excess of 500 ppm was removed. Although this level addresses satisfies the proposed Direct Contact Criteria, it does not satisfy the Ground Water Protection Criteria. Since the actual ground water flow direction appears to differ from that shown on Figure 16-3, the Navy must demonstrate that no private wells are impacted. For this reason the State cannot support a recommendation of No Further Action at the Spent Acid Storage and Disposal Area.

Response

Refer to responses to Comments 23 and 27.

The groundwater flow direction on the revised Figure 16-3 will be to the south towards Tang Avenue. This direction is towards the base boundary. The recommendations made in the draft final Phase II RI will take this into account.