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MEMORANDUM

TO: TRC Members
(See Attached)

FROM: Paul Burgess, Project Manager

DATE: March 20, 1992

RE: Responses to USEPAs Comments on Draft IR Report
U.S. Naval Submarine Base
Groton, Connecticut

On behalf of the U.S. Navy, Northern Division, attached are the referenced comments for your information. The responses to the comments on the risk assessment and the TRC comments will be forthcoming.

Paul Burgess

Paul Burgess, P.E.

P.O. BOX 297 188 NORWICH AVENUE COLCHESTER, CONNECTICUT 06415 (203) 537-0751 FAX (203) 537-6347

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NAVY RESPONSES TO EPA'S COMMENTS (NOVEMBER
ON DRAFT IR REPORT (AUGUST 19
SECTIONS 1.0, 2.0, 3.0, 4.0, 5.0, 8.
& PRELIMINARY REMEDIAL TECHNOL

General Comments

1. *Torpedo Shop: MW3, TB3 and TB4 locations are all shifted from the proposed plan.*

   The 7TB3 and 7MW3 locations were switched so the well could be located within the central portion of the septic system as a better screening of ground water quality. The 7TB4 location was slightly revised due to an elevated soil gas reading at SG15.

2. *Goss Cove: An upgradient well was proposed, but none was installed. Of all the borings and wells proposed, only TB-3 was installed at the proposed location.*

   An upgradient well could not be installed as proposed because bedrock was encountered and ground water was not present; it was replaced with a test boring. A bedrock well was outside of the scope of the Step I investigation. Although other well and boring locations were modified, the same spatial distribution of testing was achieved. Locations were changed predominantly due to utility and land development conflicts.

3. *Spent Acid Storage Area: GPR and probing of the tank was proposed, but results of those activities are not documented in the report.*

   The GPR testing was conducted in the area previously thought to be the underground tank; no tank was found and these results are provided in the Geophysical Report. Subsequent to the GPR testing, the actual tank was visually located in the field at the locations indicated in this report. One sample was collected from within the tank as described on page 4-47.

4. *Area A: Two soil samples were supposed to be collected from each of five borings, but only one was collected from MW7.*

   A soil sample was collected from 2LTB2, in an area of elevated soil gas measurement. A sample from 2LTB2 was not planned, and replaced one sample from 2LMW7.

5. *Area A Wetland: Two surface water samples were specified in the Plan of Action, but based upon review of the report, none were discussed in the report.*

   Refer to pages 2-33, 4-66 (Figure 4-16), 4-118, and 4-121 of the report, which indicate that two samples were collected.

6. *Area A Wetland: Five soil samples per boring were proposed for borings 2WTB1 to 2WTB8 (for a total of 40 samples), but only 24 were collected, according to Table 4-24.*

Boring 2WTB4 was located on a bedrock knoll within the wetland area, and only one sample was collected above the bedrock surface. Borings 2WTB7 and 8 encountered refusal prior to original planned depth, therefore, the number of samples were reduced. Several other borings encountered water and root matter in the 0 to 4 foot interval, therefore no samples could be collected.

7. *Area A Downstream: Only one surface water/sediment sample was collected at North Lake, rather than two as indicated in the Work Plan.*

The second sample planned for North Lake was relocated to a location near Triton Avenue to provide better coverage of that watercourse. Other Navy analytical data was available for North Lake which was used to assess the lake.

8. *DPDO (DRMO): The two battery storage area surface soil grab samples and eight of the proposed borings were not performed as specified in the Field Sampling Plan.*

The two surface soil samples (6SS3 and 6SS4) were collected; these locations were revised slightly based on site conditions. All borings proposed were completed at this site.

9. *Lower Subase: Of all the wells proposed, MW-1, 2, 3, 7, 10, 14 and 15 were placed in their proposed locations, the rest were not. Of all proposed ground water samples, sample WE2 was omitted. A 48-hour pumping test was proposed, but was not performed.*

The locations of most wells at this site were adjusted due to extensive utility conflicts in this area. Ground water sample WE2 was omitted because the well had been destroyed. A pumping test was proposed because it was anticipated that a product recovery system was likely required at this site. Based on the lack of measurable oil product encountered, this test was postponed and may ultimately be eliminated.

10. *The Navy indicated to EPA in the March 6, 1991 response to comments letter, that a study of tidal fluctuations was performed (comment DPDO 3, page 5). These results and the methodology used should be included in this report.*

The tidal cycle survey is discussed on pages 3-42 and 3-48 of the report.

Page Specific Comments

SECTION 1.0 - INTRODUCTION

1. *Page i, Table of Contents: Section 1.2.5.8 should indicate the Area A Landfill, Area A Wetland, and Area A Downstream Watercourse.*

   Section 1.2.5.8 of the report is Area A; the landfill, wetland and downstream watercourses are unnumbered subsections of 1.2.5.8, and therefore do not require inclusion in the Table of Contents.

2. *Page 1-1, ¶ 3: This paragraph should indicate that NSB-NLON was proposed for listing on the National Priorities List on October 26, 1989 and was listed on August 30, 1991.*

   The change will be made.

3. *Page 1-5, Section 1.2.3.1: Is there a map or a better definition of which areas of the base fall under the different ground water classifications?*

   A map can be prepared to delineate the ground water classification and included in the report.

4. *Page 1-6, Figure 1-3: A legend on this figure should be included to indicate current public water supplies.*

   The two water supply wells shown are current and active; a legend will be added for clarification.

5. *Page 1-7, Section 1.2.5: The report should indicate that five (5) sites were dropped from the IAS and the reasoning for their elimination.*

   The IAS identified 16 sites of potential contamination. The hazardous waste storage facility, the oily wastewater tank and the hospital incinerator, Sites 5, 9, and 16, respectively, were operational at that time and were dropped from the IR program. Since that time, Sites 9 and 16 have been taken out of service and will become a part of the study.

   Three lower base sites, the fuel oil storage tanks, the power plant oil tanks and building 79, waste oil pit, Sites 10, 11, and 13 respectively, have all been identified as one site, Site 13. The type of investigation required was the same for all of then and due to their close proximity it was determined to combine the investigation of these three sites into one.

6. *Page 1-9, Section 1.2.5.2: The approximate size of this site should be included in this text.*

The size of this site is approximately 15 feet in width by 30 feet in length. This will be added to the text.

7. *Page 1-13, Figure 1-7: This figure refers to both the north and south system leaching fields, but there is nothing in the text in Section 1.2.5.3 on page 1-12 which identifies these systems. Please clarify.*

The text will be clarified to provide approximate reference to these systems.

8. *Page 1-16, ¶ 1: This paragraph should include a brief statement when construction of the Nautilus Museum occurred.*

This will be provided.

9. *Page 1-21, ¶ 3: (a) This paragraph indicated that based on the IAS report, the landfill opened sometime before 1957. However, this office is in receipt of aerial photographs, one of which is dated April 10, 1957, copies of which have been forwarded to your office. Review of this aerial clearly indicates that there is no activity in the landfill area in 1957.*

The report will clarify that although the IAS report indicated landfilling prior to 1957, aerial photographs indicated a somewhat later startup date.

10. *(b) This is the first mention of the base incinerator. A very brief discussion of the incinerator should be included, e.g. location, type of wastes burned, etc.*

The incinerator was discussed in the IAS report, but a brief discussion will be provided in this report.

11. *Page 1-21, ¶ 5: The report provides information relative to a concrete pad. Is the pad still existing? Is the pad located at Building 373? This information should be provided in the report.*

The pad is still in existence. The pad is located adjacent and to the northeast of Building 373, and south of the dirt road that extends through the area.

12. *Page 1-21, ¶ 6: This paragraph should also make reference to information contained on page 1-3 in the Step IA Verification Study, namely, that "When a battery was overhauled, spent sulfuric acid solution was transferred to barrels and transported to Area A for disposal. The acid was pored into trenches dug with a bulldozer and subsequently covered with soil."*

This addition to the report will be made.

13. *Page 1-23, ¶ 1: As noted in a previous comment, review of the April 1957 aerials did not indicate any activity in this area. Also, is the approximate quantity of dredge spoils which were deposited in wetland known?*

The text will be revised to indicate disposal sometime in the late 1950s. There is no records of approximate quantity of dredged material. Estimates of the total volume of sediments in the wetland, based on the boring log information, is 1,170,000 cubic yards.

14. *Page 1-23, ¶ 5: During a previous site visit, the condition described in this paragraph relative to the potential for ground water from the stream to discharge to North Lake was examined. I had questioned the need for this overflow, since there exists another overflow structure on the southwestern corner of North Lake. It was felt that the possibility of water from the stream discharging to North Lake should be eliminated through the capping pipe.*

This condition has been previously acknowledged and a recommendation will be added to Section 8.0 to provide for eliminating this overflow pipe.

15. *Page 1-38, last ¶: This section should also note that during the summer season, the water in North Lake is chlorinated.*

This addition to the report will be included.

16. *Page 1-44, Table 1-6: A figure should be included to show the sampling locations at North Lake.*

The exact locations of the previous Navy sample results is not known. The water/sediment samples were obviously collected from within the lake, which is rather small (less than 300 feet in diameter). The beach sand samples were collected from the beach on the east side of the lake.

SECTION 2.0 - SITE INVESTIGATION

1. *Page 2-2, ¶ 4: This paragraph states the detection limits for volatile organic and semi-volatile organic compounds using CLP methods are 1 ppb for aqueous samples. However, sample quantitation limits of 5 to 50 ug/L (ppb) are listed in Table 2-1. Although some analytes are detectable below these concentrations, it should be noted, that several analytes, notable vinyl chloride and substituted phenols, will likely not be detected at 1 ppb without significant modification to the method. Additionally, historical precision and accuracy data is not applicable to concentrations below the quantitation limit.*

   The report will be modified as follows:

   "Actual laboratory detection limits are in some cases lower than the CRQLs listed in Table 2-1 due to instrument capabilities. Values reported between this level and the CRQL are estimated by the laboratory."

2. *Page 2-2, ¶ 5: It is unclear whether the detection limits used in the risk assessment (non-detect samples) were those stated in this paragraph or those provided in Table 2-1 (page 2-3). In some cases, the difference in detection limits is an order of magnitude (i.e., 1 vs. 10).*

   Treatment of non-detects for the risk assessment is described in Section 6.1.1. Values used varied based on the media of concern and in some cases chemical constituents. CRQLs from Table 2-1, when available, where used in the risk assessment.

3. *Page 2-10, ¶ 1: This office was not able to review the results of the geophysical investigations, since this report has not been made available. It is recommended that the Navy provide this report to EPA for review.*

   This report will be provided.

4. *Page 2-11, ¶ 1: Soil gas calibrations for VOCs were performed using non-standard techniques which were not specified in the Plan of Action. Atlantic prepared calibration standard using either a benzene in air standard or a headspace standard of a mixture of components in water. The use of headspace aqueous mixtures is not advised. A standard mixture of volatile components in air should be utilized to calibrate the instrument for future soil gas investigations.*

   Samples were compared to headspace standards so data could be used qualitatively, i.e. compound identification be retention time comparison. Values provided for various components were used for purposes of relative quantitation, i.e., there is more VOC contamination at Point A than Point B. It was stated in the Plan of Action that headspace aqueous standards would be used. It was also stated that soil gas would be used as a screening tool for refinement of the boring program; this was accomplished. Per your request, Atlantic will utilize a wider range of compounds of interest in air during any future soil gas investigations at the Navy.

5. *An estimate of the approximate air concentrations (ppb v/v) of the aqueous headspace*

standards should be provided to EPA to allow a review of the data generated from soil gas surveys conducted to date.

This was not specified in the work plan and would not provide a significant contribution to the project at this time. Exception is taken to this request.

6. *This section describes the component identification and quantitation technique. This discussion should be expanded to describe how data from the quality control samples was utilized, including acceptance criteria for duplicates, background samples and calibration standards. The text should be expanded to include component identification criteria.*

Background and calibration blank samples were considered acceptable if no peaks were generated. Duplicate samples were judged subjectively due to the impossibility of collecting a soil gas duplicate with a great degree of precision. Acceptance criteria for standards do not exist because retention times and response factors are rate dependent. These are variable with a system that operates in different weather conditions and must be set-up and shut-down on a daily basis. Due to this, standards were run frequently, averaging one per five samples analyzed.

Since soil gas was used primarily as a screening tool, vigorous QA/QC was not undertaken. However, the QA/QC which was performed exceeded that stated within the work plan. Compound identification was made subjectively based upon a close match of retention times. Retention time windows have not been established due to potential fluctuations based upon weather and instrument flow conditions.

7. *The calibrants did not include either 1,2-dichloroethene isomers or vinyl chloride which are major degradation products of tetrachloroethane and trichloroethane. Since the latter were found at some of the sites surveyed, the impact of this omission on the reported soil gas data should be evaluated and discussed.*

The soil gas GC is used in the field as a rapid cost effective screenage tool. For this reason the GC parameters are set such that runs were not excessively long, without compromise regarding peak separation. Vinyl chloride would be an early-eluting peak and would come out too early to distinguish it form other, unknown, early-eluting peaks. 1,2-DCE would be very difficult to distinguish from 1,1-DCE, which was one of the standards used.

Generally speaking, vinyl chloride and 1,2-DCE are often found concurrently with solvent products, as indicated in sample 6TB4 (6-8) at DRMO. It is possible that the extent of solvents were not accurately delineated by soil gas due to the difficulty of detecting vinyl chloride and 1,2-DCE as described above. However, the primary goal of the soil gas survey was to find "hot spots" of contamination as a site screening.

8. *The last paragraph states that soil gas quantitation "...took all soil gas peaks into account." It is unclear whether peaks which did not match calibration standard retention times were also included in the reported concentration.*

Unknown as well as identifiable peaks were taken into account. This provided a simple

method for giving a total volatile organic vapor reading for each sampling point. However, very early-eluting peaks (pre-1,1-DCE) were not included due to the possibility of producing a falsely high soil gas hit due to natural rather than contaminant organics.

9. *Page 2-12: The relationship of peak area to analyte concentration (v/v in air) should be provided in addition to the absolute peak area and concentration classifications shown in the table at the top of the page. Assignment of an air concentration allows the data to be compared to that obtained at other Superfund sites.*

Refer to response for Item 5.

10. *Additionally, Appendix A should be revised to include all standard and sample chromatograms for the soil gas survey. This data should be provided to EPA to allow verification of the conclusions of the surveys.*

Atlantic will provide all sample and standard chromatograms to EPA. Due to the volume of this data, this information will be given to EPA and any other interested parties, rather than included in Appendix A. This information is provided to the EPA as Attachment 1 to these responses.

11. *Page 2-12, ¶ 6: The sentence states that <1 ½-inch hollow stem augers were used to drill soil borings, but does not state whether this dimension is inside or outside diameter. The difference is important in determining the drilled diameter for inputing slug test analysis models.*

The hollow stem augers used to drill soil borings were 4.25 inches inside diameter and had an outside diameter of approximately 8 inches. Appropriate modifications to the text will be made.

12. *Page 2-13, ¶ 3: The rationale for the selection of each subsurface soil sample sent out for laboratory analysis should be provided. It should be brief and possibly be supplied in table form.*

The rationale for selection of the subsurface soil samples for laboratory analysis are provided under the comment heading in the tables summarizing the soil sampling program in Section 2.0

13. *Page 2-23, Section 2.8: The following are general comments relative to the ground water investigation that was conducted at the NSB-NLON:*

    (1) The fragmentation of ground water information according to individual sites or study areas creates confusion. It is recommended that the Navy approach the project by first looking at the base as a whole. Divisions within the base should be on the basis of the Northern Subase Watershed Area and the Central/Southern Subase Watershed Area (see Fig. 3-5) Then each site should be appropriately discussed in light of its location and impact on the watershed in which it exists.

(2) *Consistent with the above comment on base and basin-wide approaches to the project, the ground water investigation (Section 2.8) would be greatly improved if ground water potentiometric surface maps were constructed for the base as a whole and for the individual basins. These maps should also include the following:*

(a) surface elevation data from ponds located within the mapped areas;

(b) ground water level data from wells located outside the base property; and

(c) plots of ground water divides (to determine whether the ground water divides coincide with the surface water divides.

Further discussion will be provided in the text regarding specific site locations within the two watershed areas. This will be based on known ground water flow direction supplemented with assumptions on ground water flow based on available topographic and subsurface geologic information. However, the Navy takes exception to developing a ground water flow map for the entire base, which would require significant additional data on ground water elevations, which we feel is not necessary to accurately characterize the investigations at the site. Further ground water monitoring wells are proposed for Area A and the Torpedo Shops, and for the Step I sites recommended for Step II investigation, which will further establish ground water hydrology and quality.

14. (3) *The Navy should install continuous water level recorders in the following areas:*

(a) in places along the borders of the base that may be within the areas of influence of nearby private wells; and

(b) in wells near North Lake to determine whether North Lake is a discharge area for contaminated ground water.

Further assessment of ground water flow has been recommended for Area A. These comments will be considered in the preparation of the Field Investigation Plant for this work.

15. *Page 2-26: The water level and bedrock elevations on this table should also be displayed using a contour map. If additional water level measurements were collected on subsequent days, these data should also be reported.*

Refer to comment 13 for this section and comment 2 for Section 3.0. In Atlantic's review of this table, several errors in bedrock elevation were noted which will be corrected. No other ground water measurements data have been collected.

16. *Due to the proximity of the NSB to the ocean, it is likely that variation in water level elevations occurs continuously throughout the day. The text of this report does not describe what efforts were made to quantify this behavior or to correct ground water elevation data for it.*

Refer to General Comment 10 on tidal survey. The only sites projected to have water level impacts due to tides are DRMO, Lower Subase, and Goss Cove. Our evaluations of the Lower Subase indicates tidal effects are limited to approximately 200 feet inland from shoreline.

17. *Page 2-27: The screen length and screened interval shown for well 2DMW16S do not agree. These values should be corrected.*

Upon review of the original boring logs, it has been determined that a ten foot screen was used in 2DMW16S and, therefore, the elevation of the top of the screened interval is 13.91 and not 24.91 as previously stated. A change to the report will be made.

18. *Page 2-29, ¶ 1,3 and 4: Boring log and well construction information has not been provided for the bedrock wells. Thus, refinement of the subsurface bedrock system beyond the U.S.G.S. reconnaissance mapping is apparently still lacking after this field effort.*

Bedrock core data have been added to the boring logs. Well construction details and boring logs have also been constructed for the deep bedrock monitoring wells.

19. *Page 2-29, ¶ 2: (a) This paragraph states that all overburden monitoring wells were completed with a sand pack around the screen below a bentonite seal. However, six wells at the lower subase, 13MW8, 9, 15, 16, and 17 were all completed with backfill around the screen without a clay seal, according to the logs (despite the fact that the soil was contaminated). Atlantic provides no explanation for this deviation in the text of the report.*

These wells were installed in existing "sand manholes". They were installed in accordance with the detail provided in the Appendix to the FSP.

20. *(b) Although we understand the need to accurately define the water table, we disagree with the Navy's approach of screening wells over several stratigraphic units (e.g., 7MW3S). Future screens should be set to characterize individual stratigraphic units. We do not see why well screens can not be smaller than 10 feet.*

The well screen was set to provide a general screening of water quality in the water bearing stratigraphic units. The comment will be considered in future field investigations.

21. *Page 2-29, ¶ 3: The procedure for drilling bedrock wells should describe the criteria for when drilling ceased.*

Bedrock drilling continued until a sufficient water bearing fracture was encountered. A flow rate of approximately one gallon per minute or greater was considered adequate flow.

22. *EPA typically discourages the use of mud rotary drilling, especially through intervals in which a screen will be placed (e.g., an adjacent overburden well). The text should indicate whether mud was utilized through screened intervals in the well being installed or adjacent wells.*

This issue was addressed in the Navy's March 6, 1991 response to EPA's comments on the POA. The text will be clarified as follows ..."The mud rotary technique was used to maintain the opening in the overburden to allow the placement of the bedrock casing. The mud did not come in contact with the open hole within the bedrock and will not have any impact on the water quality. The shallow wells were not installed directly adjacent to the bedrock wells and, therefore, the mud should not affect the water quality."

23. *Page 2-29, ¶ 7: The text states that bedrock wells were developed using compressed air, but that two wells were developed with a submersible pump. The reason for the different development method should be stated.*

Due to low flow rates realized during drilling, a submersible pump was used to develop two of the bedrock wells; compressed air development of these wells would not have been effective.

24. *Page 2-30, ¶ 6: The text states that for the purpose of evaluating bedrock well slug test data, the saturated thickness of the bedrock aquifer was assumed to be 150 feet. Later in the document (p. 3-16, ¶ 1), the explanation for this assumption is that the average depth of most residential wells is 150 feet. This assumption is not necessarily correct. Most residential wells are only drilled to sufficient depth to establish the minimum necessary production required or the dwelling supplied by the well. Productive fractures often lie deeper; therefore, a 150 foot limit on bedrock aquifer thickness is probably not valid.*

Field observations, driller's experience, and several studies indicate that water-bearing fractures in crystalline bedrock in Connecticut tend to become tighter and more widely spaced with depth (USGS, 1968). The USGS indicates that there is only a slight probability of encountering a significant water-yielding fracture at rock depths greater than 200-250 feet (USGS, 1968). Therefore, the average saturated thickness of 150 feet used seems reasonable. Since the transmissivity is equal to the product of the hydraulic conductivity and the thickness, increasing the assumed average saturated thickness of the bedrock from 150 feet to 250 feet would increase the transmissivity proportionally.

25. *The description of hydraulic conductivity test procedures does not explain why a drilled radius of 0.25 feet (3 inches) was used in the hydraulic conductivity calculations. Since the report had previously stated that the auger diameter was 4.5 inches (presumably inside diameter), the auger outside diameter is probably at least 8 inches and probably larger.*

The well radius (r_w) was corrected from 0.25' to 0.33'. The table in Appendix D and the drawdown versus time graphs were modified to reflect this correction. In addition, if the casing radius (r_c) required adjusting in the hydraulic conductivity calculation, the valve was changed from 0.15' to 0.19' as a result of the r_w correction.

26. *(b) On this page and Appendix B, the numerical raw data needs to be provided for the hydraulic conductivity tests.*

Copies of the original time-drawdown data have been made for each well tested.

27. *Page 2-31, ¶ 2: The text should indicate the minimum time interval between well development and ground water sampling.*

The minimum time interval between well development and ground water sampling was two weeks as stated in the original Plan of Action. This addition to the report will be made.

28. *Page 2-31, ¶ 3: (a) This paragraph indicates that samples for metals analysis were field filtered. No mention is made here or in other sections of the report of collection and analysis for total metals. All data reporting tables throughout the report should be relabeled to show that results represent dissolved metals only. Future investigations, designed to collect risk assessment quality data, should include analysis for total metals.*

All analysis was conducted per the Plan of Action. This comment will be considered for future ground water analysis.

29. *(b) Future ground water sampling events should utilize an interface probe in all wells prior to purging.*

Prior to the extraction of any ground water, the depth to water was measured to the nearest 0.01 feet using a Solinst electronic water level indicator. At the Lower Subase, where oil was an issue, product thickness measurements were made.

30. *Page 2-41: DQO Level 4, as defined by EPA RI/FS guidance can only be achieved by applying EPA guidance for data validation. The latter is provided in the November 1, 1988 revision of the "Region I Laboratory Data Validation Guidelines for Evaluating Organics Analysis."*

EPA data validation requires verification of a percentage of sample calculation from the analytical raw data. This verification is not required by NEESA Level C validation. Since EPA requires data used in risk assessments to satisfy Level 4 DQOs, additional validation of the reported analytical data is necessary.

DQO Level IV was not defined as the level of QA/QC for this site. Navy Level C (DQO Level III), as defined in the NEESA document "Sampling and Chemical Analysis Quality Assurance Requirements for the Navy Installation Restoration Program," was chosen for all work on this site, as specified in the Plan of Action. Additionally, DQO Level C does not produce the necessary laboratory forms for Level IV validation, thus Level IV validation is not achievable using current laboratory data packages.

Regarding the DQO level required for risk assessments, the EPA document entitled "Data Quality Objectives for Remedial Response Activities" dated March 1987 states in Tables 4-3 and 4-4 that DQO Levels III, IV, or V may be used for risk assessment purposes. Since Navy Level C is equivalent to EPA Level III, the level of QA/QC performed for this project is sufficient for risk assessment purposes.

31. *The last paragraph in Section 2.11.3 refers to completed data review checklists which supply sample-specific validation information. These completed checklists are not provided in*

Appendix C, as implied. Data evaluation summaries, listing specific data qualification actions taken for all analysis, should be prepared and submitted to EPA as part of the data validation process. Additionally, data quality tables should be prepared to summarize all surrogate and matrix spike recovery data, all field duplicate and laboratory duplicate data and all field blank data.

A separate appendix summarizing all validated analytical results should be prepared. Additionally, a second data summary appendix, sorted by site and medium, should be submitted. Together with data validation summaries, these two appendices should provide sufficient data for EPA to verify the values presented in risk assessment tables.

The first sentence of Section 2.11.3 has been changed to "A checklist was developed to facilitate the review of analytical data reviewed under Navy Level C requirements (DQO Level III)." There was a mistake in the NEESA document used to develop QA/QC requirements for this project in correlating Navy to EPA QA/QC levels.

Atlantic has provided complete checklists for each data package and the associated validated Form I sheets for each sample to the USEPA as Attachment No. 2 to these responses. Analytical data by site and media is provided in the report. Further summaries of the validated data cannot be provided.

32. *The DQOs listed in Section 2.11.4 are not consistent with those provided in Appendix C. For example, the DQO for precision is listed as 20 percent difference in Section 2.11.4 and as 30 percent (aqueous samples) and 50 percent (soil samples) on page 11 in Appendix C. Similarly, accuracy objectives in Section 2.11.4 do not correspond to those in Appendix C.*

The report will be corrected as follows: "Precision is considered acceptable if the relative percent difference (RPD) between two duplicate samples is within ± 30 percent (aqueous samples) or ± 50 percent (soil samples)."

Although the QA/QC plan states ± 20, this was not correct and is not consistent with the Data Validation checklist. "This correction will be made in both Section 2.11.4 and Appendix C."

Atlantic was unable to see inconsistencies between accuracy objectives in Section 2.11.4 vs. Appendix C.

33. *Page 2-43: The derivation of the completeness for the investigation should be expanded either here or in Appendix C to allow for independent verification of the reported percentage. The number of valid results based on surrogate, matrix spike and duplicate data should be itemized.*

This can be provided.

SECTION 3.0 - CHARACTERISTICS OF STUDY AREA

1. *Page 3-2, ¶ 3: In discussing SCS soil descriptions, the text should state that 1) SCS soil grain size ranges are different from those used in geological and engineering practice; 2) SCS descriptions are only based upon the first five feet of soil from the surface; and 3) descriptive permeability ranges for a given soil type correspond to specific numerical values.*

   The report will include the suggested comment.

2. *Pages 3-5 and 3-6: With regard to Sections 3.3 Bedrock Geology and Sections 3.4 Surficial Geology, the following should be undertaken:*

   (a) construct larger scale base-wide and watershed maps of the surficial and bedrock geology based on literature and observations (including boring log information); and

   (b) the bedrock map should include:

   (i) topography of the bedrock surface. For example, the description on p. 3-27 (2nd para. from bottom) is not adequate characterization of the complicated bedrock surface in the area of the Area A and the OBDA;

   (ii) symbols that identify the orientation of joints and fractures in the bedrock outcrops; and

   (iii) the location of wells and borings.

   We do not feel that developing a larger scale base-wide bedrock contour map and surficial geology maps is necessary. This would require significant additional field investigation to characterize bedrock elevation and subsurface conditions which we feel is not required to adequately characterize the sites under study.

   An approximate bedrock contour map of Area A and adjacent areas, including Torpedo Shop, OBDA, CBU, OBDANE, and Bunker A-86 will be developed from the available data. Existing data on orientation of joints and fractures in bedrock outcrops will be provided on this map. This map will be at the same scale as the Plates provided in Section 3.0.

3. *(c) Important hydrogeologic features of the site should be labeled on all maps and cross-sections.*

   Please clarify what you consider important hydrogeologic features.

4. *Page 3-9, Figure 3-4: This figure needs to be clarified with respect to ground moraine deposits which appear as both stippled and hatched areas, some of which are adjacent to each other. Also, no description is present in the legend for the latter deposit.*

A legend which describes the hatched area as bedrock was provided on Figure 3-4. With regard to the comment on ground moraine deposits, the map will be revised with respect to a misplaced label.

5. *Page 3-12, Section 3.6: (a) The use of the term "obtained" is unclear. This sentence should simply state that ground water is "present" in stratified drift, till and bedrock.*

The report has been changed to reflect the requested wording change.

6. *(b) The fine-grained stratified drift aquifer appears to be a major site feature. Therefore, the following needs to be mapped:*

   (i) the edges of the aquifer;

   (ii) the thickness of the aquifer;

   (iii) the former location of Crystal Lake;

   (iv) the locations of wells within the aquifer; and

   (v) ground water potentiometric surface and flow directions.

A map from existing published sources showing Items i - iv will be provided. Data on Item v, beyond what is known for the site studied as part of this investigation, is not known. Refer to Section 2.0 Comment 13.

7. *Page 3-12, Section 3.7: The following are general comments of items that appear in this section:*

   (a) the bedrock surface is mapped in many cross sections as the point of auger refusal. The text and cross sections should note that refusal does not necessarily mean that the top of bedrock was encountered;

   (b) a key needs to be provided for the lithology symbols used in the boring logs and cross-sections;

   (c) the cross-section views should also indicate the water elevations in the wells and the interpolated water table surface; and

   (d) the cross section lines in map view should connect the actual boring points because the areas represented in the cross sections are in many cases different from the line drawn.

The requests for Items a, b, and c will be complied with. Regarding Item d, a review of the cross-sections will be made and any changes regarding horizontal scale differences will be addressed.

8. *Page 3-12, Section 3.7.1 Torpedo Shops: (a) In the first paragraph on page 3-15, borings should be undertaken to determine the contact between the Mamacoke Fm and the Sterling Plutonic Group. This contact may be fault-controlled and may be a preferred pathway for migration of contaminated ground water.*

This suggestion will be considered for further investigation at this site.

9. *(b) A boring log or a monitoring well construction detail not provided in the Appendix for well 7MW1.*

A boring log providing well construction details will be provided for 7MW1.

10. *(c) The text in the third paragraph on page 3-15 states that Atlantic personnel measured the bedrock outcrops at the torpedo shop. The measurement locations should be posted on the site map. The measurement data should be included in the report appendices.*

This data will be provided in the appropriate report figures.

11. *(d) The text appears to omit a description of the western part of the site. Here the boring log data indicates a discrepancy where silt and sand deposits overlie sand and gravel deposits at boring 7TB1 rather than reversed as shown in boring logs for 7TB2 and 7MW2S and the cross section of Figure 3-7. This discrepancy further questions the actual presence of the predominant sand and silt deposits shown to exist between 7MW2S and 7TB5 in Figure 3-7.*

Upon review of the logs and cross-sections of this area, it has been concluded that the logs and cross-sections represent the actual field conditions. The boring and well locations for this area primarily exist within areas of fill (i.e., septic system leachfields), which may be the primary reason for the apparent reversal of data. The soils were not described as fill in the borings logs or cross-sections unless there were distinct features (i.e., wood, glass, etc.) that positively identify fill.

12. *(e) The boring log for 7MW3S is not consistent with the cross section view (Fig 3-7).*

A change to the cross-section will be made to separate the fine sand units from the fine to medium sand unit.

13. *(f) The drainage swale is a significant hydrogeologic feature in the torpedo shops area and should be included in the cross section view (Fig 3-7).*

The drainage swale will be shown on the cross-section.

14. *Page 3-24, Section 3.7.5 Area A and OBDA: (a) On page 3-27, ¶ 5, this paragraph describes cores drilled in selected bedrock wells at Area A. Appendix B provides no descriptions of these cores, other than the interval cored. A complete log of the cored interval should be included as a standard of the boring log so that the log can be compared to the description in the text.*

The core descriptions will be provided for applicable bedrock monitoring wells.

15. *(b) On page 3-27, ¶ 6, this paragraph discusses bedrock topography based upon boring data at Area A. Atlantic should prepare a bedrock topography map based upon well control, geophysics, and rock outcrops.*

As stated in Comment 2 of this section, Atlantic will prepare a bedrock contour map for Area A. Note that the geophysical surveys were not designed to assess bedrock elevation.

16. *(c) On page 3-27, ¶ 7, the text states that Atlantic personnel measured the bedrock outcrops at Area A. The measurement data should be included in the report appendices. The paragraph has no discussion of how these measurements tie into know data on rock structure in this area, or whether the joints in the outcrops show any correlation to foliation orientation, as fractures in the cores described in paragraph 5 seem to do.*

The measurement data will be included in the report. Dip angles measured in core fractures did not consistently correlate to dip angles measured in bedrock outcrops in Area A. Although there are no general trends linking the bedrock outcrops to the core data, the dominant core fracture dip angles were 45°.

17. *(d) In Figure 3-16, the north arrow on this figure is rotated approximately 44 degrees east of its actual orientation. Bedrock joint strike and orientations plotted on this figure therefore may not be correct and should be checked.*

The north arrow on the figure will be corrected. The bedrock joint strike and dip orientation are correct.

18. *There are many more bedrock outcrops in the area which should be surveyed for fracturing and jointing orientations.*

This comment will be considered for future work efforts in this area.

19. *(e) In the second paragraph on page 3-33, Figure 3-4 does not clearly show the features described here. Again, basin-wide geologic maps would be very useful.*

Refer to Comment 2 of this section.

20. *(f) The following two comments are relative to Figure 3-18 and Appendix B:*

(1) the locations of auger refusals at shallow depths should be re-drilled a few feet away before that location is exited. For example, boring 2WTB4, located in a difficult area in the center of the Area A Wetland, was drilled only to 0.83 feet. No effort seems to have been made to confirm whether this refusal was a local anomaly (e.g., a boulder).

On occasion auger refusal was reached at relatively shallow depths; it was standard

practice for Atlantic personnel to relocate the boring and attempt to drill several feet away from the original location. If refusal was again shallow, the boring would have would have been relocated until the hole was properly advanced, or it was determined that the original hole was representative of actual conditions and not a local anomaly. This procedure was followed at 2MTB4.

21. *(2) the draft report should explain the rationale behind the placement of approximately 25 feet of sand filter pack material below the well screen in 2LMW9S. The representativeness of the data collected from this well is likely to be very uncertain.*

Data for 2LMW9 was incorrectly entered into the boring log program (i.e., wrong fill pattern was given, etc.). Upon review of original field log book, it has been determined that bentonite was used to seal the hole below the sand pack in 2LMW9S. The boring log will be revised.

22. *(3) cross-section B-B' would better represent conditions if the following were done:*

(a) 2LTB5 was not utilized because this point creates the illusion of an undulating bedrock surface which may not exist.

(b) 2LTB1 should be utilized, since it is actually located on line B-B'.

However, it is recommended that cross-section B-B' be redrafted along the line of borings labelled 2LMW13S, 2LMW13D, 2LMW9S, 2LMW13D, 2LTB1, 2WTB1, 2WTB6 and 2WTB7.

Based on EPA's recommendation, cross-section B-B' will be redrafted to include 21MW13S, 13D, 2LMW9S, 2LTB1, 2WTB1, 2WTB6 and 2WTB7.

23. *(g) The following comments are relative to Figure 3-19 on page 3-32.*

(1) In cross-section C-C' on page 3-32, data from 2LMW7 (approximately 120 feet away from line) is used rather than 2WTB2 (approximately 20 feet away from line). The hydrology varies between these points, for example:

(a) fill is absent at 2WTB2 while 2LMW7 identifies 16 feet of fill.

(b) topsoil is identified below the dredge spoil at 2WTB2, yet this top soil is absent at depth at 2LMW7S.

Refer to response to Comment 24 below.

24. *(2) In cross-section C-C' and the text both 2LTB3 and 2LTB1, which are located between 2LMW7 and 2LMW9, encountered refusal at 66.6 feet MSL and 64 feet, respectively, while 2LMW7 encountered bedrock at 53 feet MSL and 2LMW9S encountered refusal at 42.5 feet MSL. Either the cross-section conceptualization is incorrect or refusal within the dredge*

spoil cannot be assumed to be the top of the bedrock.

Cross-section C-C' will be reconstructed and will include the following borings:

The borings 2LTB3 and 2LTB1 are not included in the cross-section C-C'. It is assumed that refusal for these two borings must have been on large boulder fill and not bedrock, therefore, cross-section C-C' does indicate a deeper depth to bedrock between 2LMW7 and 2LMW9.

25. *(3) Boring 2LMW9S identifies several units below the dredge spoil which strongly suggest the presence of fill rather than "natural" sand and gravel. Cross-section C-C' should reflect this condition.*

Cross-section C-C' will be revised to address this comment.

26. *(4) The use of 2MW16 next to 2MW15 in cross-section C-C' may be misrepresenting the local geology in light of the topographic high between the two borings.*

Boring 2WMW16 will be removed from cross-section C-C'.

27. *Page 3-35, ¶ 1 A rationale for the procedure used to measure ground water elevations in offsite wells needs to be provided. Why was an initial measurement taken, the well pumped, remeasured and the lowest measured used?*

The lowest well measurement (lowest elevation) was used because this represents a worst case condition with respect to ground water gradient from offbase wells to on-base wells (e.g., does well drawdown create a condition where on-base ground water contamination could migrate to offsite wells). This explanation will be added to the text.

28. *Page 3-36, ¶ 1 (a) Vertical head gradients are discussed in this paragraph, but no calculations are included in this report. The text mentions a ± 1 foot upward gradient in one case, but it is not clear if the 1 foot is the head difference between the two wells or a gradient of + 1 ft/ft.*

The text will be changed to reflect that the ± 1 foot upward gradient is more accurately a ± 1 foot vertical head difference.

29. *(b) We don't believe that one round of ground water elevation is sufficient to conclude that bedrock ground water does not discharge into North Lake. Continuous recorders should be installed at the 2DMW16 wells in addition to head measurements in North Lake to determine ground water/surface interactions between North Lake and the ground water system.*

This comment will be considered in the development of the plan for additional work in Area A. We may elect to manually collect water level measurements on a pre-determined time interval and duration.

30. Page 3-38, 39 *These two cross-sections, which intersect at 6TB3, do not match. 6TB3 has different stratigraphy in each cross-section and for other wells, the stratigraphy is incomplete. For example, silt and clay on the logs is shown as sand and silt on the cross-section. The length of cross-section B-B' in Figure 3-23 is 565 feet, but the cross-section line in Figure 3-21 is 458 feet.*

The cross-sections will be revised to further separate the units. The horizontal scale on the cross-section B-B' will also be revised.

31. Page 3-40, ¶ 5 *A review of the abbreviated single well pumping test for well 6MW2 shows that the well was not pumped long enough to get meaningful data. The transmissivity was calculated from early time data only (0.001 minutes to 10 minutes). However, review of the semi-log plot shows that the rate of drawdown increased after ten minutes. This delayed yield is usually due to dewatering effects in an unconfined aquifer, thus early time data is not representative of overall aquifer conditions. Had the pumping test been run out to 1000 minutes instead of 62 minutes, a greater Δs for use in the time-drawdown analysis would have been calculated.*

By using the Δs for the data from 10 to 62 minutes, a T of 1058 ft^2/day and a K of 53 ft/day can be calculated using the time-drawdown method. This result is much closer to the textbook value of 50 ft/day that Atlantic ultimately relies on for their estimates of flow velocity and aquifer discharge to the Thames River. In reality, had the pumping test been run to 1000 minutes, the drawdown data would have to have been corrected for the effects of an unconfined aquifer or the time-drawdown method would not have been a valid analysis.

The comment is noted, however, no changes to the report appear to be required.

32. Page 3-41 *Given the massive bedrock outcrop and rapid elevation change east of the railroad tracks, the elevation 2 foot and especially the 3 foot contour (above ground elevation 70) in the overburden aquifer shown in this figure are suspect and should be reviewed.*

Upon review of Figure 3-24, it is apparent that the contours on this figure should be revised. The contours will be changed to more accurately follow topography.

33. Page 3-42, Section 3.7.7, Lower Subase *With regard to this section, the construction of wells with backfill filter packs in wells 13MW8, 13MW9, 13MW15, 13MW16, and 13MW17 deviates from the April 1989 Final Plan of Action (Appendix B) and description of work in the Draft Report (i.e., the "clean washed Ottawa sand" p. 2-29, 2nd para.). The rationale for this deviation needs to be provided.*

Refer to Comment 9 in Section 1.0. Sand manholes are constantly being replenished with sand due to washout underneath the bulkhead. Therefore, if a sand pack was used during installation of the monitoring well, it would have only been a temporary condition facing eventual washout.

SECTION 4.0 - NATURE AND EXTENT OF CONTAMINATION

1. *Page 4-2, ¶ 4 The statement for ARAR and TBC using arsenic as an example is inappropriate.*

   This paragraph merely explains the rationale for selection of values to be included in Table 4-2. Atlantic feels its inclusion is necessary to explain Table 4-2. Table 4-2 is a summary table, which Atlantic prepared to show the values of chemical-specific ARARs. In any particular site the procedures described Appendix D must be used. This specific characterization will be made in the feasibility study after remedial action objectives and general response actions have been developed.

2. *Page 4-2, ¶ 6 The use of the published background values for inorganic concentrations in soil is not acceptable. The reference cited includes background concentrations calculated from the entire Eastern United States. All efforts should be made to obtain actual samples for the determination of background values. The objective of this is to analyze "clean" samples specifically associated with the site. The use of USGS survey information may be used as a last resort only.*

   A wide range of inorganic concentrations are found throughout the region, as soil types and bedrock geology varies. Furthermore, use of the "95 percent value limit" as a typical background concentration is not reasonable; this implies the assumption that subase soils, in the absence of site-specific contamination, have some of the highest inorganic concentrations found in the Eastern United States. Uncontaminated local background samples should be collected.

   These values were used for illustrative and comparative purposes. Even if we complied with this request, it would not affect the conclusions of the study with respect to human health or environmental impact. Actual metals concentrations were used in these assessments and in the calculation of risk. We would propose to add a discussion to indicate that actual background concentrations at this site are less than the USGS published values.

3. *Page 4-3 These tables on ARARs are currently being reviewed by the Office of Regional Counsel.*

   Noted. When is the Office of Regional Counsel going to submit their comments?

4. *Page 4-3 This table would be more useful if it contained citations for each requirement. At this stage of the investigation, the Navy should be able to explicitly reference specific citations for sites especially for chemical- and location-specific ARARs. The broad references to regulations will make it difficult to determine which aspects of each regulation is ARAR/TBC criteria.*

   The notes section at the end of this table will be revised to show explicit statute or regulation citations.

5. *A number of these ARARs should also be included in the action-specific listing if they apply to the use of technologies and allowable discharge/emissions limitations (i.e., CAA, NESHAP, etc.).*

We had grouped federal ARARs as presented in Part II of the CERCLA Compliance With Other Laws Manual, however, we agree the NESHAP requirements should be listed as action specific ARARs. NPDES and NSPS are presently listed as action specific ARARs.

6. *It is unclear why the RCRA Solid Waste Standards are categorized as "Not ARAR" instead of "Potential ARAR". Appendix D states that Bunker A-86 is one of six areas which contain solid waste. Similarly, it is also unclear why this table categorizes the Federal RCRA UST Standards and state UST regulations as "Not ARAR". Again, Appendix D (Page D-2) states that the Torpedo Shops site is one of three sites that contain underground petroleum storage tanks. This table should be corrected accordingly to reflect the status of ARARs as explained in Appendix D.*

Agree, tables will be revised. See response No. 10 below for further explanation regarding UST standards.

7. *The Toxic Substances Control Act (TSCA) should be categorized as "TBC" for the Torpedo Shops since PCB contamination has been detected in this area.*

Agree, table will be revised. TSCA standards where not originally characterized as a potential ARAR as no TSCA regulated PCB items are known to have been present at this site.

8. *<u>Page 4-3</u> The analytical methods utilized for this study do not provide aqueous detection limits suitably low for several of the ground water ARARs or TBCs listed in Table 4-2. Of particular concern are the volatile organics vinyl chloride, benzene, chloromethane and 1,2-dichloroethane and several semi-volatile organic polynuclear aromatic hydrocarbons (PAHs).*

The April 1989 Final Quality Assurance/Quality Control and Data Management Plan, prepared for the Navy by Atlantic, provided a summary of analytical methods in Table 5-5. The table listed EPA's "Methods for Determination of Organic Compounds in Finished Drinking Water and Raw Source Water" in addition to EPA "SW-846 Test Methods for Evaluating Solid Waste" as methods to be employed in addition to the CLP SOW protocol. The EPA drinking water Method 524.2 and SW-846 Method 8310 provide aqueous detection limits more appropriate to the study objectives than CLP methods.

Refer to comment #26 in Section 2.0. The suggested revised laboratory protocol will be incorporated into future sampling at this site.

9. *<u>Page 4-4</u> For presentation purposes, it is recommended that the Navy separate Area A and OBDA as discussed in previous discussions. This column is misleading when, for example, TSCA is considered TBC for Area A but not for OBDA.*

Atlantic does not feel this distinction is necessary. For presentation purposes OBDA was considered to be part of Area A Downstream, and the Area A wetland and landfill were presented as separate areas.

10. *Page 4-7 It is unclear why the Navy categorizes federal RCRA and state UST Standards as "Not ARAR" for the Torpedo Shops. Appendix D states (1) (Page D-2) that the Torpedo Shops site contains underground petroleum storage tanks, and (2) (Page D-14) the Naval Installation Program does address oil and petroleum contamination.*

Agree, table will be revised to show UST standards as potential ARAR. The UST standards were not originally characterized as a potential ARAR as there is no evidence of petroleum contaminants from the UST, and no remediation under UST regulations is anticipated.

11. *It is also unclear why the Navy categorizes the federal RCRA and state Solid Waste Regulations as "Not ARAR" for the Rubble Fill at Bunker A-86, and why the Navy categorizes the state Solid Waste Management Regulations as "Potential ARAR" for the CBU Drum Storage Area. These categorizations are not consistent with discussions in Appendix D which state that these regulations are potentially applicable for the Bunker A-86, and not applicable for CBU Drum Storage Area. This table should be corrected to reflect discussions in Appendix D.*

Agree, table will be revised to reflect discussions in Appendix D.

12. *It is unclear why the Navy categorizes the PCB Regulations under TSCA as "Not ARAR" for the Torpedo Shops Site. Appendix D (Page D-15) states that "It is believed that the PCB contamination in Goss Cove, DRMO, and Area A Landfill resulted from the storage of transformers containing greater than 50 ppm of PCBs. At the Torpedo Shop, the source of PCBs is unknown." Since these standards regulate the disposal and cleanup of PCBs, the Navy should include the federal PCB regulations as ARAR.*

See Atlantic's response and Comment 7 in this section. TSCA should only be listed as a TBC at the Torpedo Shops, as the regulations adopted under TSCA regarding PCBs (40CFR 761) only apply to PCBs in concentrations above a specified level (40CFR 761.1(b)). There is no evidence that there are any items at the Torpedo Shop above the specified level. Clean-up standards under TSCA regulations (40CFR, Part 61, Subpart G) are only policy guidelines and therefore can not be classified as ARARs.

13. *The Navy should also categorize the Connecticut Siting Council Hazardous Facility Siting Regulations as "Potential ARAR" for all sites since the need for construction of any new hazardous waste disposal facilities has yet to be determined.*

The regulations are only applicable to hazardous wastes as defined in these regulations. For sites that do not contain hazardous waste, these statutes are not potentially ARARs. Only sites that contain hazardous waste should have these regulations listed as potential ARARs. As stated in Appendix D, these sites are Lower Base, DRMO, and Spent Acid Storage and Disposal.

14. Page 4-9, Table 4-2 *The following revisions are necessary relative to ground water:*

(1) Barium has a proposed MCL and MCLG of 2000 ppb.
(2) Cadmium has a final MCL and MCLG of 5 ppb.
(3) Chromium has a final MCL and MCLG of 100 ppb.
(4) Copper has a proposed MCL and MCLG of 1300 ppb.
(5) Lead has a final action level of 15 ppb based on treatment technique. FR. (Vol. 56, No. 110, 6/7/91).
(6) Silver does not have a final MCL.
(7) Gross Alpha MCL is 15 pCi/L.
(8) Chloroform does not have a final MCL.
(9) 1,2-Dichloroethene has a final MCL of 70 ppb.
(10) Ethylbenzene has a final MCL of 700 ppb.
(11) Tetrachloroethene has a final MCL of 5 ppb.
(12) Xylene has a final MCL of 10000 ppb.
(13) Endrin does not have a final MCL of 0.2 ppb.
(14) Methoxychlor has a final MCL of 40 ppb.
(15) PCBs should be corrected to PCBs.

Due to recent changes in the federal drinking water regulation, Atlantic agrees that several of the above listed values should be listed in Table 4-2 with the following exceptions based upon State of Connecticut Drinking Water regulations where they are more stringent: barium = 1,000 ppb, chromium = 50 ppb, copper = 1000 ppb, silver = 50 ppb, gross alpha = 5 pCi/L, chloroform (total trihalomethanes) = 100 ppb, endrin = 0.2 ppb.

15. Page 4-9, Table 4-2 *The additional revisions to this table are necessary:*

(1) Soil does not have chemical-specific ARARs or TBCs. It is not understandable why the same number presented as ARARs for ground water are also presented as TBCs for soil for some compounds. Also, the values presented for PCBs and dioxin and TCLP values for some compounds may be action-specific rather than chemical-specific ARARs and TBCs.

The soil TBCs were based upon written guidance that the State of Connecticut has developed; see page D-8 of Appendix D for further explanation. To the extent that these values have been used as clean standards at sites throughout Connecticut, they should at least be considered in selection of a final remedy. However, we agree that it is unlikely that these values will become remedial action objectives.

16. *(2) What is the purpose of listing marine AWQCs for inland surface waters?*

The Thames River is a marine estuary not an inland surface water.

17. *(3) It is not appropriate to compare AWQC to ground water.*

EPA guidance (EPA/540/G-89/006) states that water quality criteria adjusted to reflect only exposure from drinking the water may be useful in selecting a cleanup level when

a promulgated MCL does not exist. This adjustment generally does not substantially change the AWQC value. However, the table will be revised to use corrected AWQC values regarding ground water for consideration when an MCL has not been promulgated.

18. *Page 4-16 References to ARARs should include dates, since these are updated regularly.*

Dates will be added to the references in the notes section at the end of the table.

19. *Page 4-18, Section 4.5 (a) In the 3rd paragraph, the values of TCE and PCE are compared to the TBC values. As previously noted, there are no TBC values for soil.*

Refer to Comment 15 in this section.

20. *(b) It is indicated on page 4-25 that pesticide "blocks" were placed on the wetland ice and dispersed via melting of the ice. The detection of delta-BHC and methoxychlor may indicate disposal in this area and should be further examined.*

Conversations with Navy personnel indicate that pesticides were also applied by spraying. Based on the fact that the pesticides were detected in shallow soil samples and at relatively low concentrations, pesticide disposal in this area is not expected.

21. *Page 4-25, Section 4.6 (a) There is no discussion of the results from samples of surface water and sediment samples from the Torpedo Shop area (e.g., 7SW and 7SD). These items must be included in this section.*

In ¶ 2, it states that sediment and surface water analysis results are included in the Area A discussion. This was done because these drainage swales/intermittent watercourses are part of the Area A Downstream Watercourses system.

22. *(b) The septic tanks from the torpedo shops should be sampled in future phases of the work.*

Atlantic intends to include septic tank sampling in future investigations at this site.

23. *Page 4-26, Figure 4-3 The Navy indicated that soil borings and wells would be positioned based on the results of soil gas surveys in a March 6, 1991 response letter to EPA (response 1a, page 1). However, there is no soil sample, boring or well located at the soil gas "hot spots" which were observed at the north leachfield. This omission should be explained, and if possible, a soil boring should be advanced at the location of the hot spot in subsequent field investigations.*

Accessibility in this area was difficult with a drill rig. Well 7MW2 was downgradient of this location, and significant solvents were not detected in the ground water. A soil sample collected by hand auger will be considered for future investigation.

24. *Page 4-35, Section 4.7.3 Trace to low levels of 1,2-dichloroethane and TCE were found at SG1 and SG9 which appear to be outside the extent of the previous fill areas. Also, high*

levels of PAHs were found in 8TB3 which also appears to be outside of these areas. Future work will have to expand investigations in that area.

As stated in Section 2.6.2, only moderate to high soil gas detections are normally associated with potential source areas. An upgradient well will be planned in future field investigations in the SG1/SG9 area to assess ground water quality, which could result in the detection of low levels of solvents in the soil gas. Further sampling in the 8TB3 area will also be considered.

25. *Page 4-38, Figure 4-6 The text should indicate why soil borings were not located within the areas of soil gas hot spots which are indicated on this map.*

Refer to Comment 2 under the general comment section.

26. *Page 4-63, ¶ 1 The separately bound geophysical report should be provided.*

This will be provided.

27. *Page 4-64, Section 4.11.1.4 On page 1-21, reference is made to a concrete pad where drums, etc. were stored. However, review of the sampling locations does not appear that any borings or sampling was performed in this area. Please provide the rationale.*

Surface soil samples 2LSS1 and 2LSS2 were collected adjacent to the concrete pad. Also, refer to recommendations for additional sampling in this area (page 8-18).

28. *Page 4-102, Section 4.11.4 This office does not agree with the third sentence in the fourth paragraph which commences with "As discussed in Section 3.0, the..." for the following reasons:*

(a) Section 3.0 (p. 3-36) states that "bedrock ground water likely does not discharge into North Lake." Whether or not bedrock ground water discharges into North Lake has not yet been conclusively determined because the Navy's presumption is based on one round of water level measurements from one well pair.

Refer to Comment 29 in Section 3.0.

(b) The water table was found to be 1.3 feet below ground surface during the 3/21/91 water level measurement event. At this elevation, ground water from the overburden aquifer can be expected to be discharging into North Lake. If an when the lake is emptied out, then the chances are even greater that ground water will discharge into it.

The text will be clarified to acknowledge this comment.

29. *(c) It appears that the Plan of Action was not followed by having only one of two planned soil lab analyses from 2LMW7S and, instead, having one unplanned lab soil analysis for boring 2LTB2. The rationale for this deviation and for the selection of all other subsurface soil sample locations need to be provided.*

Refer to Comment 4 in the general comments section, and to Comment 12 in Section 2.0.

30. *(d) Analytical data for well 2LMW13S is not provided in Tables 4-32 and 4-33 or Plate 4-2, yet it is described in the text as a location where cadmium was detected (p. 4-102). The data for this well needs to be provided.*

As noted in Table 2-2 on page 2-33, this well was dry and was not sampled (i.e., no ground water in overburden). The text will be revised to clarify that elevated cadmium was detected at 2LMW13D.

31. *(e) A boring log for 2WMW4S needs to be provided.*

The proposed monitoring well 2WMW4S was not installed due to existing site conditions, as well as complications involving Navy regulations regarding the Weapons Storage Area. The drilling rig was gasoline-operated and, therefore, was not permitted to enter the weapons storage area due to safety reasons. During installation of 2WMW4D, attempts to push split-spoon samplers using the drilling rods were unsuccessful due to boulders and cobbles in this area, therefore, no boring logs could be developed. Bedrock was encountered at approximately 9.0 feet; ground water was not observed within this interval.

32. *Page 4-145, Figure 4-32 Based upon the text, it is unclear how the soil contamination limits shown in the figure were defined.*

The figure was an approximate delineation of "hot spots" of soil contamination for illustrative purposes. In the Feasibility Study, a more detailed assessment of risk based contaminated soil areas and volumes will be made.

33. *Page 4-147, Table 4-51 Radiological screening values were exceeded at the Goss Cove Landfill, Area A and the DRMO; exceedances were attributed to natural sources at these sites. Additional radiological screening at sites believed to represent typical background conditions for the area is necessary to support this hypothesis given the possibility of radiological contamination based on site history.*

This work is underway.

34. *Page 4-151, ¶ 1 Additional investigations and collecting of surface water and sediment samples may be required to fully evaluate potential impact of the lower subase site on the Thames River. While no seeps were observed during a waterfront inspection, contamination was found in other media, and seeps are likely to be periodic.*

This work was already recommended in Section 8.0 of the IR report (page 8-25).

SECTION 5.0 - CONTAMINANT FATE AND TRANSPORT

1. *Page 5-1, ¶ 4 The text acknowledges that solubility, vapor pressure, Henry's Law constant, K_{oc}, and K_{ow} are dependent on temperature. The applicable temperatures for these parameters should be provided in Table 5-1.*

   The reported temperatures for these properties are usually in the range of 20° to 30°C. This can be added to the table as a note.

2. *Page 5-1, ¶ 6 The last sentence of this paragraph indicates that solution into the liquid phase will control the rate of volatilization for some materials. This sentence is not clear. Henry's Law is an equilibrium coefficient and the rate of solution into the water phase will not influence this parameter. This sentence should be clarified.*

   The sentence referred to does not say that solution into the water phase influences the Henry's Law coefficient. The sentence can be modified to read: "However, for compounds with low solubilities and high values of the Henry's Law coefficient, resistance in the liquid phase controls volatilization."

3. *Page 5-4, Footnote (c) K_{oc} values are estimated by the method presented by Lyman et al. (1982). The last sentence on page 7-11 provides a method of estimation of K_{oc} attributed to Markwell et al. (1989). A consistent method of estimation of all of the mobility parameters should be used.*

   The notes on page 5-4 are a key to the references from which the chemical properties were taken and refer to the reference column in Table 5-1. Most of the chemical properties were reported in reference a, the Superfund Public Health Evaluation Manual (1986). Only where compounds were noted with a "c" in the reference column, were K_{oc} values estimated from Lyman et al., 1982. These are compounds that did not have reported K_{oc} values in the Superfund manual.

   The next to the last sentence on page 7-11 states that we used K_{oc} instead of K_{ow} in Markwell's equation. We used the same K_{oc} values in this equation that we reported in Table 5-1.

4. *Page 5-5, ¶ 3 Soil characteristics such as porosity, soil water content and soil bulk density are discussed as parameters which are important in determining the mobility of contaminants at NSB-NLON. Organic carbon content, pH, eH, cation exchange capacity, particle size distribution, clay content are also important. However, it does not appear that these parameters have been measured at the site. These parameters should be measured. If they are already known, they should be discussed in this section.*

   Of these parameters, only organic carbon content was used in the risk assessment. If field measurements are made, it is only necessary to measure this parameter for the purpose of the ecological risk assessment. In our assessment, we estimated a conservative value of 5%. If any of these other parameters are determined to be needed to supplement the Feasibility Study evaluation, recommendations will be made at that time.

5. *Page 5-5, ¶ 3,4 The movement and mobility of light and dense non-aqueous phase liquids should be discussed in these sections.*

A few paragraphs regarding NAPL and DNAPL will be added to this section.

6. *Page 5-9, ¶ 4 Dibenzofuran is measured as part of the semi-volatile analysis. In locations where dibenzofuran was detected, an analysis for all chlorinated dioxin/furan compounds should be performed.*

This request is under evaluation and will be further discussed with the USEPA.

7. *Page 5-11, ¶ 1 The last sentence in this paragraph should be amended to include the presence of other metals which will also influence the mobility of metals in the environment.*

This sentence can be amended to read: "Environmental factors influencing the mobility of metals in the environment include pH, eH, the presence or lack of oxygen, the presence of other metal compounds such as iron oxides, and the presence of anions and complexing agents."

8. *Page 5-12, Section 5.2.1.1 A conceptual model for each site should be presented or referenced in this section to illustrate the various exposure routes resulting from contamination at each site. This would clarify the presentation of exposure routes and ensure that all exposure routes are considered.*

Conceptual models will be prepared for each Step II site and generically for the Step I sites.

9. *Page 5-13, Section 5.2.1.3 Some discussion on the phenomena of precipitation of dissolved metals in estuaries should be mentioned. This phenomena occurs when metals which are in equilibrium with fresh water encounter elevated levels of anions present in salt water. Flocculation and precipitation of these metals has been demonstrated in these situations. This mechanism should be considered and the possibility of contaminant accumulation in the estuary should be discussed.*

The following wording will be added: "The section of the Thames River near NSB-NLON is an estuary. Within an estuary the changing of the river from fresh to salt-water conditions has substantial effects on suspended and dissolved material in the river. Destabilization of colloids, alternation of adsorption equilibrium and precipitation of cationic species are among the commonly observed changes. There is a general tendency for trace metals, and potentially hydrophobic organic compounds, to be trapped in estuarine sediments as a result of these processes.

10. *Page 5-14, last ¶ The statement "... and the following inorganics above MCLs: barium, sodium, iron and manganese" is confusing, because only barium has a current MCL of 2 ppm.*

This sentence will be revised to make it clear that MCLs were exceeded only for barium, and that the state notification level for sodium was exceeded. Iron and manganese will not be classified as TBC values.

11. Page 5-15, ¶ 3 *It is not clear if the metals concentration presented for the ground water is determined using filtered or unfiltered ground water samples. Both filtered and total metals should be measured in the ground water. This will allow the evaluation of the presence of metals in the colloidal size material. Facilitated transport of colloidal material by ground water has been demonstrated as a mechanism of transport for otherwise insoluble and immobile materials.*

This same paragraph indicates that metal compounds are tightly bound in the soils. This is inconsistent with the fact that arsenic, cadmium, chromium and lead exceed TCLP TBC values. This sentence should be modified to include this information.

All ground water samples for total metals analyses were filtered. Although facilitated transport may be a transport mechanism at NSB-NLON, a total metals analysis may be representative of formation materials. Drilling, development and purging activities may be the source of some colloidal material in ground water samples rather than the metals being representative of the colloid suspensions in formation ground water.

Future work plans will consider provisions for total and filtered metals analysis, and include the most recent procedures regarding well purging and sample handling designed to collect colloid suspensions, however, any data generated by itself will not demonstrate conclusively whether or not facilitated transport is a significant transport mechanism at this site. As mentioned above, it is probably not possible to distinguish between actual mobile colloid suspensions and those caused by well construction, development and purging activities.

12. Page 5-16, Section 5.2.2.8 *The statement, "The following other organics were measured above ARAR or TBC values: iron, manganese, sodium and aluminum" is inappropriate. For ground water MCLs and MCLGs are ARARs and drinking water Health Advisories are TBCs. For the four metals listed above, only sodium has drinking water equivalent level which may be considered as TBC. Secondary MCL for the other three inorganics are neither ARARs or TBCs unless there are state standards for these compounds. Based on this statement and other previous statements in the documents that, when it comes to compare contaminant concentrations to ARARs and TBCs, it is not clear what standard the values are being compared to.*

In our identification of ARARs and TBCs, secondary MCLs were incorrectly classified as TBCs. The report will be revised so that secondary MCLs will not be TBCs. Sodium had a state MCL that has recently been changed to a notification level.

13. Page 5-17, ¶ 2 *Variability of transmissivity in the fractured bedrock is mentioned in this paragraph. The significance and impact of fractured material on contaminant transport should be mentioned in Section 5.2.1.2.*

Section 5.2.1.2 will be revised to include a discussion of contaminant transport in fractured bedrock. Bedrock fractures offer a preferential flow path for contaminated materials. Depending on the fracture network orientation degree of fracturing, transport rates in bedrock could exceed those in overburden materials. Transmissivity values ranged from 4.2 to 250 square feet per day, indicating a high variability of transmissive properties within the fractured bedrock and that migration in bedrock fractures potentially is a significant contaminant migration pathway.

14. *Page 5-18, ¶ 1 As noted in a previous comment, the recommendation was made to plug the invert in order to eliminate the possible condition of water from the stream discharging to North Lake at times of high flows. This comment should be reiterated in this paragraph.*

The referenced comment will be reiterated in ¶ 1 on page 5-18.

15. *Page 5-18, ¶ 2 Lead and copper are identified as contaminants of concern in surface water. The suspected source of this material should be identified.*

Copper and lead are present in upgradient surface water and ground water and are present in above background concentrations in Area A landfill soils. The copper and lead apparently originate from natural and anthropogenic sources upgradient of Area A and from materials in Area A landfill. The contribution from Area A Landfill is not believed to be very significant as upgradient levels are relatively high and as concentrations in landfill soils only slightly exceed soil background levels.

16. *Page 5-18, ¶ 5 This paragraph states that not enough data is available to define the most significant pathway for cyanide.*

This argument is used several times in the report and strongly indicates that additional data is required at these sites. See comment for Page 5-5, ¶ 3 for additional data requirements. An aqueous geochemistry model should be used to evaluate the speciation of all inorganics of concern. This will allow an evaluation of the mobility of the inorganics at the site in light of site-specific aqueous geochemistry.

The comment in ¶ 5 refers primarily to a lack of information regarding the speciation of cyanide, not in regard to lack of information regarding soil characteristics, although, soil pH in addition to cyanide speciation would be helpful in predicting the fate of cyanide in soil. Please refer to response to comment for page 5-5, ¶ 3 regarding soil characteristics. Cyanide may occur in several forms including: hydrogen cyanide, alkali metal salts, or metallocyanide. Each form has distinctly different physical/chemical characteristics. For example, solubility in water ranges from insoluble to completely soluble for different forms of cyanide.

The report recommends additional investigation regarding this cyanide contamination. The recommendation will be made more specific and state that future investigation attempt to identify the forms of cyanide present by laboratory analysis.

17. *Page 5-18, ¶ 6 The presence of chlorinated dioxin at this site should be investigated. See comment for Page 5-9, ¶ 4.*

Refer to response to Comment 6 in this section.

18. *Page 5-19, ¶ 4 Reduced conditions are indicated as the possible mechanisms for precipitation of metals. The eH of the soils and ground water at each Step II site should be measured.*

Oxidized conditions are indicated as the possible mechanism for precipitation of metals and reduced conditions are indicated as a possible mechanism for leaching iron and manganese from native soils.

The report recommends an additional round of ground water samples; eH measurements will be included.

SECTION 6.0 - HUMAN HEALTH RISK ASSESSMENT AND

SECTION 7.0 - ECOLOGICAL RISK ASSESSMENT

These comments were discussed with the USEPA at the meeting held on February 13, 1992. A separate response for these sections will be forthcoming.

SECTION 8.0 - SUMMARY AND CONCLUSIONS

1. *Page 8-1, Section 8.0: The cover of Section 8.0 states "Summary and Conclusions" while the text inside states "Summary and Recommendations". The purpose of Section 8.0 should be clarified.*

   The cover will be modified to state "Summary and Recommendations".

2. *Page 8-1, Section 8.0: (a) The ARARs and TBC mentioned throughout this section are confusing. It is necessary to indicate the exact value and the exact standard or criterion the concentration of the contaminant of concern is compared with.*

   A general statement will be added after the first paragraph referring the reader to Section 4.0 for an explanation of specific ARAR/TBC values. The Navy disagrees with the request, and feels that including the regulatory standard and reference for every discussion of a specific chemical, in itself, would be confusing. Section 8.0 is a summary which likely will be used by the TRC members and the general public. For this reason, it was purposely kept general.

3. *(b) It is necessary to state the exact risk based on the risk characterization. The term (de minimum risk" or "within one in one thousands risk" give a very vague description of the results of risk characterization.*

   A statement will be added after the first paragraph explaining in general the risk terminology.

4. *Page 8-1, ¶ 1: The fact that analytical results from a particular site did not result in contaminant values that exceeded ARARs or risk-based criteria, is not a sufficient means for determining whether the site should undergo further investigations.*

   The CERCLA criteria for determining whether an RI/FS should be performed on a particular site does not consider ARARs or risk based values. Generally, the amount of sampling which is performed for a PA/SI (Step I investigation) is only sufficient to determine the presence of contaminant, not the nature or extent. Furthermore, all media are not typically sampled in the PA/SI phase.

   The PA/SI relies on "indicators" of a release to determine if further investigation is necessary. If evidence of a release is noted, and the Hazard Ranking Score is higher than a predetermined threshold value, the site is listed on the National Priorities List and must undergo the RI/FS process. In the case of the three sites which the Navy proposes for No Further Action, evidence of a release was noted at all three sites, and therefore the sites should continue to be investigated.

   The Navy recommends that all Step II sites proceed to the Feasibility Study stage; however it is not clear that sufficient data have been collected for the three Step II sites.

   We feel the site has been adequately investigated and assessed to support the no further action recommendation. Further discussion on this issue is suggested.

5. *Page 8-1, Section 8.1.1.1: Since, as the Navy indicates, "a small release may have occurred" at this site, additional investigation should be performed to determine the nature and extent of contamination, and to perform a quantitative risk assessment.*

Only one soil analysis for inorganics was performed. Given that the sample contained concentrations of lead which may be related to waste stored at this site, additional soil samples should be collected.

Volatile organics and semi-volatile organics were detected in composite surface soils at this site. Since compositing can dilute contaminated samples by adding uncontaminated sample to the composite, additional subsurface sampling should be performed for volatile and semi-volatile organics. Ground water sampling should also be performed to assess concentrations of organics and inorganics. Analytical methodologies for both media should be chosen to provide detection limits below the ARARs/TBCs.

We feel the site has been adequately investigated and assessed to support the no further action recommendation. Further discussion on this issue is suggested.

6. *Page 8-3, ¶ 4: Additional ground water analysis for PCBs and pesticides should also be performed.*

We would intend that the recommended further ground water analysis conducted at the Torpedo Shop will include PCBs/pesticides.

7. *Page 8-5, ¶ 10: Soil sampling for dioxins and furans should be performed to assess potential contamination in incinerator ash.*

Refer to comment 6 in Section 5 for a response to this request.

8. *Page 8-6, ¶ 2: Additional further investigations that should be performed include:*

- *borings and/or wells placed at the location of soil gas hot spots;*
- *soil sampling below ten feet near 8TB2 and 8TB3 due to the high levels of PAH detected; and*
- *soil and ground water analysis for organics and inorganics.*

These comments will be considered in the development of the work plan for future investigation at this site.

9. *During our previous site visit on October 8, 1991, booms were surrounding the three outfalls which discharge in the Goss Cove area. It was noted that on occasion, oil residues, both No. 2 and No. 6, flow from these drainage pipes. The source of this oil was said to be storage tanks underneath the baseball field. The sediments along the shore in this area should also be examined.*

This comment will be considered in the development of the work plan for future

investigations at this site.

10. *Page 8-6, ¶ 6: Only one soil location was sampled for inorganics and two locations for organics. At least three samples should be collected and analyzed for full TCL/TAL prior to recommending this site for no further action.*

Additionally, ground water should be analyzed for organic and inorganic constituents.

We feel the site has been adequately investigated and assessed to support the no further action recommendation. Further discussion on this issue is suggested.

11. *Page 8-7, ¶ 7: The Step I investigation did not include any soil borings advanced to the water table, although the most likely release mechanism and pathway at this site would be a UST leaking and infiltrating down into the ground water. EPA can not concur with the Navy's no further action recommendation for this site until such soil sampling is performed, and ground water samples are collected.*

Our recommendation includes tank removal and confirmation soil sampling directly below the tanks. This will be the most direct way to confirm that no tank leakage occurred. If contamination is found to have occurred, soil remediation will take place as well as ground water assessment. However, if no contamination is identified at that time, no future action will be taken.

12. *Page 8-10, ¶ 5: This paragraph implies that the origin of the VOCs detected in the dredge spoils is the Thames River. It is unclear how such contamination could be present in the river sediments. Regardless of the original source, the soils are now themselves a contaminant source.*

Residual levels of VOCs would likely be associated with Thames River sediment, due to the industrial nature of the watershed.

13. *Page 8-13, ¶ 2: The text discusses a plume at Area A in the bedrock. A figure showing the estimated extent of the plume should be presented.*

Plate 4-1 in Section 4.0 will be used to illustrate the approximate extent of ground water contamination.

14. *Page 8-13, ¶ 5: A series of cross-sections showing the flow field and the contaminant distributions should be presented in this discussion.*

We do not feel that providing this information will add to the understanding of site conditions. The ground water quality data ia already summarized on Plate 4-1.

15. *Page 8-14, ¶ 3: The text states that "...it is indeterminate if these [offbase residential] wells are upgradient or downgradient of the western portion of the Area A Landfill. From the ground water contour maps, it appears that these wells are "side gradient" from the landfill, an alternative possibility to consider.*

Your comment is true. We have proposed the additional sampling to confirm the ground water flow in this questionable area.

16. *Page 8-18, Landfill Soils: Landfill soils should also be sampled for chlorinated dioxins and furans to assess contamination from incinerator refuse.*

Refer to the response to comment 6, provide in Section 5.

17. *Page 8-19, North Lake: During our previously noted site visit, ground water seepage at the east end of the lake was evident. Sediments at this point as well as ground water should be analyzed for the TAL and TCL.*

An additional recommendation should be to cap or remove the eastern overflow pipe which may allow some of the drainage from the Area A to enter North Lake.

We will consider analysis of the ground water seepage in supplemental field investigations.

The latter recommendation has been added to the text.

18. *Page 8-19, Downstream Watercourses and Pond: Two unnamed ponds to the Northeast of North Lake were visited and appeared to be lacking in wetland ecological activity. Some benthic surveys should be performed to evaluate benthic populations. In conjunction with this, toxicity testing should be performed on the sediments at depositional areas of downstream water courses and the two above-mentioned ponds.*

Additional sediment sampling and analysis for TCL and TAL is needed for the "lower" pond on the north side of downstream area "A". One sample is not sufficient to characterize the pond. On all sediment results, units should be indicated as being on a dry or wet basis.

With the possibility of wetland remediation, there is the need to properly delineate the wetlands on the Navy property as well as those that are affected by contamination whose source lies within naval property boundaries. This must be done as described using the Federal Manual for Identifying and Delineating Jurisdictional Wetlands.

On page 8-19, additional assessment of the biological community in this area was recommended. Your specific comments will be considered in the design of this program.

Additional sediment sampling will be considered as part of our recommendation of additional surficial soil sampling in this area.

We are aware that wetlands exist in Area A; and the general boundaries are known. The wetlands regulations will be considered as an ARAR. Following the Feasibility Study, and as part of any remedial design, specific wetlands procedures will be established at that time.

19. *Page 8-22, ¶ 8: Since the DRMO was reportedly used as a burning ground, the near surface soil should be sampled for the presence of chlorinated dioxins and furans.*

Refer to the response for comment 6 in Section 5.

20. *The outflow labeled 2DSD12 on the DRMO had considerable output. There is a need for additional sampling along the shore line of the Thames River upstream, downstream, and outward. There is also a potential for periodic flooding of the river on to the DRMO causing further contamination which should be examined.*

Recommendation #1 on page 8-22 included additional sampling in the Thames River. We do not believe that flooding of the site by the Thames River is of significant concern as a contaminant source, and do not feel that further evaluation of this issue is required, other than to address erosion of contaminated soils from DRMO to the Thames River.

21. *An additional recommendation should be to install monitoring wells in the areas where high "hits" were recorded, such as in the vicinity of 6TB4.*

This will be considered for future field investigation.

APPENDICES

Appendix A

The depths of the soil gas samples should be provided in the Appendix A tables.

The depth was approximately three feet, except at the Lower Base where the depth is 12-18 inches due to utility conflicts.

Appendix D

1. *(1) Page D-3, ¶ 4 The second sentence of this paragraph states, "The state has classified the water quality of this segment of the Thames River as SC/SB." It should be noted that the CTDEP is currently considering changing this SC/SB water quality classification to SA. For completeness, the Navy should provide an updated water quality discussion pertaining to this potential water quality classification.*

   The text will be revised to note this potential change.

2. *(2) Page D-5 The second sentence of the sixth paragraph pertaining to the applicability of the state Hazardous Waste Management Regulations states, "For all applications to chemical specific ARARs, Connecticut's regulations are identical to EPA's." It should be noted that Section 22a-449(c)-106, "Standards for the management of specific wastes and specific types of hazardous waste management facilities" states that more stringent provisions may need to be addressed pertaining to spent lead-acid batteries. The final disposition of spent lead-acid batteries is currently unknown for the OBDA, therefore, these regulations may be considered potentially an ARAR if these materials ("spent batteries") are transported, stored, or collected for recycling or reclaiming.*

   After a re-analysis of Section 22a-449(c)-106, no chemical-specific standards are evident. These regulations reference the requirements in 40CFR Part 266, Subpart G and contain standards regarding handling, storage, inspection, accumulation, and registration of spent lead acid batteries. No chemical-specific standards are included in this regulatory section.

3. *(3) Page D-12 The seventh paragraph states, "See discussion on federal RCRA standards. There are no significant differences regarding location standards between federal and state regulations." While we agree with this statement, there are more stringent provisions for chemical-specific ARARs provided in Section 22a.-449(c)-106. See previous comment regarding spent lead-acid batteries corresponding to Page D-5.*

   See response to Comment 2 above. Potentially this regulatory section could be an action-specific ARAR if batteries are discovered and if these batteries are to be recycled. To date no batteries have been discovered. This requirement will be classified as a potential action-specific ARAR for the large landfill areas where it is possible that batteries were disposed, i.e., Area A Landfill, DRMO and Goss Cove.

4. *(4) Page D-13 The second paragraph states, "The NSB-NLON property is presently an*

existing well field and to date has not been identified as a potential well field ARAR." The Aquifer Protection Areas (22a-354a through 356 CGS) should remain potentially an ARAR pending the final completion of these requirements.

You misquoted our statement. We stated that the property is <u>not</u> presently an existing well field. Please clarify comment.

5. *<u>(5) Page D-18</u> Subsections 4.1 and 4.2 provide discussions of federal and state requirements that will be considered in selection of a final remedy at NSB-NLON. The Navy should provide a limited discussion for each TBC similar to the discussion for ARARs. Also, two of the three state TBCs under the Department of Health Services and CTDEP should be included in Table 4-1.*

A limited discussion will be provided for all TBCs listed in subsections 4.1 and 4.2.

Table 4-1 does include a listing for Standards for Drinking Water and for Water Pollution Control and the existence of TBC values under these laws is indicated to exist at all sites. Table 4-1 is general in nature. A breakdown into every regulatory section and guidance document will detract from its usefulness and is not warranted at this stage of the RI/FS process. The remedial actions sections of the FS will clearly specify all ARARs on a site basis in light of the general response actions being considered.

<u>Appendix E</u>

A justification should be provided for samples that were analyzed but not included in the risk assessment. For example, in Appendix E, the list of samples used for the scenario involving subase children exploring Area A streambeds and wetland (sediment) has only a partial list of sediment samples collected from Area A. Please justify the exclusion of samples 2WSD3 through 2WSD9. Justifications should be provided for samples excluded from other scenarios, as well.

These comments will be discussed with the USEPA.

<u>Appendix F-1</u>

There is no indication in the species list of any freshwater finfish. This shows inconsistency within the document. If fish were anticipated to inhabit ponds in the downstream areas, as indicated by a proposed fish survey in April 1990, they should be included. If they were omitted due to their absence in the ponds, then the possible reasons should be addressed, i.e., contamination, habitat requirements, etc.

<u>Appendix F-2</u>

Units should be indicated as part of the heading.

This comment will be addressed with the USEPA.

SECTION 1.0 - PRELIMINARY REMEDIAL TECHNOLOGIES

1. *Page 1, ¶ 5, Item 1 Development and Screening of Alternatives lists five (5) steps; however, these steps are not consistent with the CERCLA RI/FS Guidance (EPA, 1988), Section 4.1.2.1 which lists six (6) general steps relative to the development/screening of alternatives. These steps identified in the RI/FS Guidance include:*

   1) development of remedial action objectives
   2) development of general response actions
   3) identify volumes and areas of media
   4) identify and screen technologies
   5) identify and evaluate process options
   6) assemble remedial alternatives

   Note that 3 of the 5 items listed in the FS document [identify treatment technologies..., screen technologies, and identify action-specific ARARs] all fall under Item (4) above. Thus, the list provided above is more comprehensive in outlining the components of the alternative development process.

   The list provided is more comprehensive and will be used, and it will be noted more clearly that the purpose of this Feasibility Study report section is solely to identify and screen technologies to eliminate those that cannot be implemented technically at the site.

2. *Page 1, ¶ 5 The upfront discussions regarding technology screening/alternative development should identify whether an operable unit approach is being utilized by the Navy to address discrete site areas and/or media. Such information needs to be included in the FS because each alternative must be designed such that it addresses all areas or media included within the specific operable unit designation.*

   For instance, if an entire site consisting of soil and ground water contamination is addressed as a single operable unit, then each alternative must incorporate technologies which affect treatment of soils and ground water. If soils and ground water are treated as separate operable units, then separate alternatives would be developed for each media. Thus, alternative development must proceed in concert with the operable unit approach being used (if any) by the Navy.

   Note that the operable unit approach not only applies to site media, but can be used to separate discrete portions of a facility into separate areas (each subject to separate RI/FSs).

   The operable unit approach will be used in the FS for alternative development, screening and detailed analyses. Technology screening and the evaluation of process options will be done on a media basis and will include comments specific to operable units as necessary. This section of the FS will note the approach taken.

3. *Page 2, ¶ 6 Section 1.2, Screening of Technologies is not developed in a manner consistent with the CERCLA RI/FS Guidance, Section 4.2.4 Identify and Screen Remedial*

Technologies and Process Options.

CERCLA Guidance specifies that the technology screening process includes the following two steps: 1) the universe of potential applicable technology types are screened on the basis of technical implementability, and 2) for technology types not screened during the first step, technology process options are evaluated based on effectiveness, implementability, and cost to select a representative process option for each technology. The representative process options are then combined to formulate remedial alternatives.

The Groton FS document presents only a single technology/process option screening step, and the criteria for conducting this initial screening effort are not clearly stated. No representative process option is selected for each technology, thus the Navy's efforts are incomplete.

It is recommended that the Navy adopt the two-step approach recommended in the CERCLA Guidance. The first screening step should evaluate technical implementability (including the ability of the technology to achieve preliminary remediation goals or ARARs).

The second step should evaluate each process option on the 3 criteria stated above.

The sole purpose of this document is to identify and screen the universe of potentially applicable technology types based on technical implementability. As noted in the response to Comment 2 above, this clarification will be made in the introductory text.

4. *Page 4, Table 1-1, Areas of Concern (a) This table does not present information or data which is substantial enough to support the technology screening effort. To properly assess the "implementability" of a technology at the site, it is important that the FS state the volume/areas of media requiring treatment, and a complete list of chemical compounds present in each medium.*

Table 1-1 provides a qualitative discussion of health risks associated with the DRMO, Lowerbase, and Area A. These discussions give little insight into the nature of the contamination problem at each site. To properly support a technology screening effort, this table should present for each media at each site, a complete list of the chemical compounds which pose a carcinogenic risk or non-carcinogenic risk under baseline conditions, the current concentration of the compound, and the risk estimate. Next, the table should present a target risk range [acceptable risk range] and a target or clean-up concentration for each compound.

The above information would inform the FS personnel as to what contaminants need to be treated, and to what level, thus providing them with the information needed to select the appropriate technologies.

Note - the information discussed above (i.e., target clean-up levels) should actually be folded into the Remedial Action Objectives (RAOs) for the site. RAOs should be developed prior to technology screening, and should specify the contaminants of concern, exposure routes

and receptors, and a quantitative target clean-up level or goal based on ARARs and the risk assessment.

We agree with this statement, however, Table 1-1 was intended only to show qualitative risks. Quantitative values will be developed in the remedial action objective section of the FS which is presently being developed.

5. *(b) It is stated that there are no ecological risks at both the DRMO and Lowerbase. Additional sampling and information must be gathered before this conclusion can be drawn.*

This statement will be revised to state that, based on existing information, there are no predicted ecological risks. Additional sampling and assessment was recommended in Section 8.0.

6. *Page 7, Table 1-3 In the Screening Comments relative to the Fencing process option, it appears the last sentence is not complete.*

This sentence will be revised to read as follows: "This process option could be used in conjunction with containment process options to make a more effective alternative."

7. *Page 8, Table 1-3 Screening of Technologies for Soil/Sediment Under the "biological" treatment category, aerobic degradation is cited as a potential technology. The screening comments indicate this technology is not applicable for metals, and may not degrade PCBs. This technology is then cited as a "Potential Option" for all three source areas (Area A, DRMO, LWR Base).*

   1. *Table 1-1 indicates the DRMO is contaminated with PCBs, PAHs and metals, thus, considering the ineffectiveness of aerobic degradation in treating PCBs and metals, the use of this technology at this site is not warranted.*

   2. *Table 1-1 indicates soils in the Lowerbase pose no risk. Thus, according to Table 1-1, remediation of soils is not warranted at this site.*

   3. *Table 1-1 indicates that Area A soils are contaminated with PCBs, thus, the use of aerobic degradation at this is clearly not warranted based on the screening comment.*

   As indicated above, there appears to be no rationale for the selection of aerobic degradation as a process option. The upfront information is inadequate to select a process option, and the screening and process option selections are inappropriate.

It is noted that the above problem is noted in numerous instances in Table 1-3. For instance, on p. 9, soil venting is selected as a process option for treating soils in all three areas. Soil venting is appropriate to the removal of VOCs; however, as indicated above, the

contaminants of concern at the DRMO and Area A are PCBs and metals. Therefore, the use of soil venting at these sites does not appear to be a viable option.

As a final consideration, site-specific conditions must be considered in determining whether a technology is readily implementable at a site. For instance, grain-size distribution of site-soils will affect suitability of solidification/stabilization technologies, BTU content of soils will affect efficiency of incineration technologies, etc. For this reason, a preliminary identification of technologies should be conducted to enable FS personnel to compile a list of site-specific data needed to select appropriate technologies during the screening process. This type of site-specific data should be presented in up-front sections of the FS to support technology screening. If the data needed to support technology selection has not been collected, it may not be appropriate to screen technologies until this type of data is collected.

It is thus recommended that, future sampling programs specify the collection of all data needed to support the technology screening effort. Note that this data collection effort must be suitable to support technology screening and alternative development, but need not be specific to the point where it supports remedial designs.

As stated in the summary of this report (Section 1.3), these tables are informational in nature and serve the sole purpose of ensuring that an appropriate range of technologies and process options are developed. A prudent approach was used in screening technologies, and many were retained for reasons that are not evident at this stage of the RI/FS process. At this time, many issues regarding remedial action objectives have not been resolved and, therefore, these objectives have not been adequately defined. For example, DRMO contains soils with substantial VOC contamination that could be treated by soil venting or aerobically and the Lower Subase contains soils with soil contamination that could be degraded aerobically. Remediation of these areas is only indicated by TBC values and, therefore, were not included in Table 1-1 (areas of concern). Upon establishment of final remedial response objectives, the table will be re-evaluated and modifications made as appropriate.

Work plans for future work at these sites will consider inclusion of relative and applicable feasibility data requirements.

8. *Page 8 The screening comment for in situ anaerobic degradation states that this is a pilot stage technology, therefore, was not considered further. This rationale is also used in the screening of several other technologies in later sections. However, since the NCP indicates a preference for treatments which are innovative, technologies should not be screened exclusively because of their innovative nature.*

We agree that innovative technologies should not be eliminated solely because they are innovative and have included several that are potentially feasible for further evaluation. The comments in this section will be revised to also indicate that this technology has not been demonstrated to be very effective.

9. *Page 10 Anaerobic treatment of sludges has been performed for many years at industrial and municipal waste treatment facilities. It does not appear to warrant consideration as a*

pilot stage technology as stated in the screening comments for this entry.

We are aware of no demonstration projects other than at laboratory scale regarding anaerobic treatment of soils or sediments contaminated with hazardous substances. For these reasons this technology was classified as pilot scale even though many field scale units exist for treatment of POTW sewage sludges.

10. *Page 12 The screening comments for ground water control indicate that feasibility of this technology is questionable in areas adjacent to the Thames River due to large volumes of infiltration. However, infiltration can be minimized by use of sheet pilings, so the implementability of this technology should not be affected by infiltration from the river.*

Infiltration can be minimized but not eliminated by use of a sheetpile. Presently, there is a sheetpile bulkhead in existence at the Lower Subase. This option was retained for further evaluation. To address this comment, the wording will be revised to read as follows: "Implementability will be complicated and effectiveness diminished in areas adjacent to the Thames River...."