N00129.AR.000663
NSB NEW LONDON
5090.3a

DEPARTMENT OF THE NAVY
NORTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
10 INDUSTRIAL HIGHWAY
MAIL STOP, #82
LESTER, PA 19113-2090

5090
Code 1823/ME

IN REPLY REFER TO

12 AUG 1998

Mr. Mark Lewis
Connecticut Department of Environmental Protection
Bureau of Water Management
Permitting, Enforcement & Remediation Division
79 Elm Street
Hartford, CT 06106-5127

Dear Mr. Lewis:

SUBJ: RESPONSES TO CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION COMMENTS DATED JULY 15, 1998 ON THE DRAFT REMEDIAL INVESTIGATION REPORT FOR THE LOWER SUBASE SITE, NAVAL SUBMARINE BASE - NEW LONDON (NSB-NLON), GROTON, CT

Please find enclosed the Navy's responses to your comments of July 15, 1998 on the Draft Remedial Investigation Report for the Lower Subase site at NSB-NLON.

If you have any other question or comments please do not hesitate to call me at (610) 595-0567 ext. 162.

Sincerely,

Mark Evans

MARK EVANS
By direction of the
Commanding Officer

Copy to:
Mr. Jeff Sullivan, NSB-NLON
Ms. Kymberlee Keckler, USEPA Region I
Mr. Corey Rich, TetraTech NUS - Pittsburgh

RESPONSES TO CTDEP's JULY 15, 1998 LETTER OF COMMENTS REGARDING THE APRIL, 1998 DRAFT REMEDIAL INVESTIGATION REPORT FOR THE LOWER SUBASE NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT

August 11, 1998

GENERAL COMMENTS (COVER LETTER)

1 Requirements of the Remediation Standard Regulations

Comment: The State is concerned that this remedial investigation does not adequately consider the Remediation Standard Regulation requirements regarding direct exposure and pollutant mobility. No further action is recommended for several sites despite the fact the lead and other contaminants are present at concentrations which exceed the direct exposure and pollutant mobility criteria. The Navy must comply with these requirements. The Remediation Standard Regulations provide a number of alternative methods for complying with these requirements, in addition to conducting active remediation. The feasibility study must consider remediation or other methods for complying with these requirements.

Response: Direct Exposure Criteria (DEC) are adequately addressed in the Remedial Investigation (RI). Section 22a-133K-2(d)(2) of the State of Connecticut Remediation Standard Regulations (RSRs) allows for the development of a risk assessment in accordance with the most recent EPA Risk Assessment Guidance for Superfund to address direct exposure. This RI provides a risk assessment that addresses risks associated with direct exposure to site-specific contaminants. Contaminants of Concern (COCs) were determined by screening concentrations against appropriate DEC (Federal criteria and CTDEP RSRs). The scenarios evaluated in the risk assessment were provided in the Work Plan (WP) for the RI. The CTDEP was given the opportunity to review and comment on the WP.

COCs identified by screening concentrations against the Pollutant Mobility Criteria (PMC) are defined in the RI. The significance of the COCs are qualitatively discussed in the RI. The recommendations of the RI will be changed to indicate that each zone will proceed to a Feasibility Study (FS). All potential ARARs will be evaluated in the FS.

2 Requirements of the Remediation Standard Regulations

Comment: The Navy's recommendations are not consistent between the different zones. For example, the Navy speculates that lead contamination in Zone 4 soils may be originating in Zone 3. However, no further action is recommended for soils in Zone 3, while a feasibility study is recommended in Zone 4.

Response: The quantitative human health risk assessments performed for Zones 3 and 4 indicated that only Zone 4 had unacceptable risks. In addition, it is likely that the lead contamination detected in Zone 4 is the result of historic contaminant migration and not the result

of an ongoing source. The remedial action completed by the Navy at Zone 3 (Building 31) significantly reduced the source of lead and the Navy has eliminated the process that resulted in the lead contamination. The text for Zone 4 will be clarified to indicate that the source of the lead contamination is probably from historic contaminant migration.

The recommendation for Zone 3 will be changed to indicate that the zone should proceed to a FS. All potential ARARs will be evaluated in the FS. A tiered monitoring program will be one of the alternatives evaluated in the FS. The proposed monitoring program for Zone 3 will verify or disprove the potential contaminant migration problem.

3 Requirements of the Remediation Standard Regulations

Comment: Most of the Lower Base is either paved or covered with buildings. For this reason the Navy may be able to take advantage of Section 22a-133k(2)(b)(3). This section specifies that the direct exposure criteria for substances other than PCB do not apply to inaccessible soil less than 15 feet below the ground surface provided that an environmental land use restriction is in place to ensure that the soils will not be exposed as a result of excavation, demolition, or other activities and that any pavement which is necessary to render the soil inaccessible unless and until the land use restriction is released. Inaccessible soil is defined as "polluted soil which is (A) more than four feet below the ground surface; (B) more than two feet below a paved surface comprised of a minimum of three inches of bituminous concrete or concrete; or (C)(I) beneath an existing building or (ii) beneath another existing permanent structure provided written notice that such structure will be used to prevent human contact with soil has been provided to the Commissioner". In order to take advantage of this exemption, the Navy will be required to demonstrate that a sufficient thickness of pavement exists.

Response: Comment Noted. The Navy is aware of Section 22a-133K(2)(b)(3) and the definition of inaccessible soil. The Navy does not wish to categorize the soil of the Lower Subase as inaccessible soil because of the Environmental Land Use Restriction requirement.

4 Requirements of the Remediation Standard Regulations

(PMC)

Comment: The ~~direct exposure criteria~~ apply to all soils above the seasonal high water table in a GB area. For this reason, it is important that the navy define the elevation of the seasonal high water table.

Response: Disagree. The State of Connecticut RSRs do not clearly state that DEC apply to all soils above the seasonal high water table. In addition, DEC are not specific for GA or GB areas. Further documentation is required from the State regarding this information.

All soil samples collected during this RI and previous investigations were collected from the unsaturated zone. For this RI two categories of soil, "shallow soil" and "all soil," were defined and evaluated as part of the risk assessment. The definition of "shallow soil" varied for each zone, but was either 0 to 4 feet or 0 to 5 feet. "All soil" was defined as 0 to 10 feet. This category was defined to account for a construction scenario and the typical depth of excavation. Therefore, definition of the seasonal high water table was not critical for completion of this RI.

5 Light Non Aqueous Phase Liquids

Comment: The feasibility study report appears to suggest that separate phase petroleum may be present at various locations throughout the Subase. The Navy should be aware that the

Remediation Standard Regulations require that LNAPLs be removed to the maximum extent practical.

Response: To clarify, the report in question is a RI and not a FS as indicated in the comment.

The Navy is aware of the requirement of the RSRs that LNAPLs be removed to the maximum extent practical. Free-product measurements were taken in all wells sampled during this RI and free-product was only detected in one well (13MW18 in Zone 1). A remedial alternative will be included in the FS for this zone that addresses removal of free-product. All potential ARARs will be evaluated in the FS.

6 Catch Basin Sediments

Comment: Lead is present in sediments in several catch basins at concentrations as high as 85,600 mg/kg. These sediments constitute a significant potential source of pollution to the waters of the State which must be addressed. This also suggests that there is a potential for violations of the base storm water permit.

Response: The sediment samples in question were collected in April of 1993. The concentrations of lead detected in Zone 5 sediment samples 19SD1 and 19SD2 were 85,600 mg/kg and 185 mg/kg, respectively. Concentrations of lead detected in Zone 5 soils were as follows: shallow soil ranged from 1.7 mg/kg to 91.2 mg/kg and deep soil ranged from 1.3 mg/kg to 14.6 mg/kg.

As stated in the text, lead ballast and equipment used to load it on to submarines were stored in this area. It is likely that some ballast may have washed into this catch basin. Lead ballast and the loading equipment are no longer stored in this area. In addition, paint chips were noticed in the sample 19SD2. It is also possible that the elevated level of lead is related to paint chips. Based on this information, the high detection of lead in this one sediment sample is most likely related to lead ballast or lead-based paint which may have washed into the catch basin, and not overburden soil or general contamination of the storm water in this drainage field.

The Navy will evaluate the need to clean and repair the storm sewer system as a remedial alternative to prevent contaminant migration. Remedial alternatives will be evaluated during the FS for the Lower Subase. Additional sampling and analysis of the storm sewers will be completed as part of the proposed monitoring program after the appropriate remedial alternatives are completed.

SPECIFIC COMMENTS

1 Page ES-4 Section ES.2.2 Contaminant Fate and Transport (Zone 1)

Comment: The text discusses the use of natural attenuation. While natural attenuation may be appropriate in some situations for remediating petroleum and other organic substances, it will not be effective in dealing with the significant concentrations of lead that are present in soil at many locations in the Lower Base. This comment applies also to Section ES.3.2 on page ES-8, ES.4.2 on page ES-11, Section ES.5.2 on page ES-15, Section ES.6.2 on page ES-18, Section ES.7.2 on page ES-21, and Section ES.8.2 on page ES-25.

Response: Comment noted. The Navy understands that natural attenuation is not effective in dealing with inorganic contamination (i.e., lead). The text of Section ES.2.2 indicates that natural attenuation is a feasible process because of the presence of biodegradable contaminants (i.e., petroleum hydrocarbons and SVOCs). No where in the text of the Executive Summary or the remaining sections of the RI report does it indicate that the Navy is considering natural attenuation for inorganics.

2 Page ES-5 Section ES.2.3 Baseline Human Health Risk Assessment (Zone 1)

Comment: The text states in the first paragraph that the State's acceptable range for carcinogenic risks is 1E-5. This applies to the cumulative risk posed by multiple contaminants. The State's acceptable risk for individual contaminants is 1E-6. This statement applies also to the second paragraph on page ES-8, to the third paragraph on page ES-11, to the second paragraph on page ES-15, to the first paragraph on page ES-19, to the last paragraph on page ES-21, and to the second paragraph on page ES-25.

In the third paragraph the text states that appropriate surface water protection criteria are generally the State's salt water quality standards with a factor of 10 applied. This statement is inaccurate and should be revised to reflect the requirements of Section 22a-133k-3(b)(3) of the Remediation Standard Regulations. That section provides two methods for calculating alternative surface water protection criteria. This comment applies also to the first paragraph on page ES-9, to the second paragraph on page ES-12, to the second paragraph on page ES-16, to the third paragraph on page ES-19, to the second paragraph on page ES-22, and to the second paragraph on page ES-26.

Response: Comment noted. The text of the report will be modified to clarify that the cumulative carcinogenic risks for a particular site are either less than or greater than "the CTDEP cumulative carcinogenic risk level of 1E-5". An approach for addressing the CTDEP's carcinogenic risk level of 1E-6 for individual chemicals and USEPA's requirements will be discussed and developed during an August project meeting. Following the meeting, the approach will then be incorporated into revisions to the Lower Subase RI Report.

The existing text was provided to (1) stress the fact that the direct comparison of groundwater data to Connecticut Water Quality Standards (WQSs) provided in the report is a conservative screening approach and (2) emphasize that if alternative criteria (more appropriate criteria for the site) were to be developed, the resultant criteria would be greater than the Connecticut WQSs by as much as an order of magnitude. The text of the RI that discusses alternative surface water protection criteria is not consistent with Section 22a-133k-3(b)(3) of the RSRs. The text of each section will be modified to indicate that the appropriate alternative surface water protection criteria are calculated by multiply the lower of the human health or aquatic life criterion in the latest

Connecticut Water Quality Standards by a site-specific dilution factor. Recently calculated site-specific dilution factors for the DRMO (dilution factor = 226) and Goss Cove Landfill (dilution factor = 118) will be referenced in the text. These two sites are adjacent to the Thames River. The DRMO is north of the Lower Subase and Goss Cove Landfill is south of the Lower Subase.

3 Page ES-12 and 13 Section ES.4.4 Recommendations (Zone 3)

Comment: The Navy proposes no further action for soil in this zone, which includes Building 31. Building 31 was the site of a removal action in 1995 to address lead contaminated soil. No further action is not acceptable for soil at this site as high concentrations of lead (up to 5.88 mg/l measured by TCLP) were detected in several soil samples. These concentrations exceed the GB pollutant mobility criterion for lead as well as the RCRA criteria for characteristically hazardous waste. Compliance with the GB pollutant mobility criteria for all soils above the seasonal high water table is required at this and all other sites in the Lower Base.

The Navy states in the sixth bullet point on page ES-13 that "a majority of the lead- contaminated soil that historically acted as a source of contamination to other media has been remediated". This statement ignores the fact that significant concentrations of lead remain in the soil at this site. This lead apparently continues to act as a source of contamination to ground water since lead was detected at concentrations up to 392 µg/l in ground water beneath the building.

In addition, this recommendation is not consistent with the Navy's recommendation to conduct a feasibility study for soils in Zone 4. The Navy speculates that lead contamination detected in Zone 4 may be originating from the area of Building 31 in Zone 3. While the Navy does not recommend further action for soil in Zone 3, it does recommend that a feasibility study be conducted for Zone 4 soils. The Navy may be able to demonstrate that the soils beneath Building 31 are environmentally isolated under the Regulations.

Response: The Navy collected additional soil samples during the RI and the samples were analyzed via the Synthetic Precipitation Leachate Procedure (SPLP). The sampling and analysis were completed to confirm or disprove the potential lead mobility problem. The CTDEP had a similar concern at the Spent Acid Storage and Disposal Area (SASDA). Additional sampling and analysis completed by the CTDEP at the SASDA disproved the lead mobility problem at that site. The SPLP results for the Lower Subase indicate that there is a potential problem at one well (MW1-3RI); however, lead was not detected in the groundwater sample collected from this well. The recommendation for Zone 3 will be changed to indicate that this site should proceed to a FS. A tiered monitoring program will be one of the alternatives evaluated in the FS.

The lead concentration of 392 ug/L referenced in the comment is from a historic unfiltered groundwater sample collected from a temporary well (GW-02) installed inside of Building 31. The maximum concentrations of lead detected in one filtered sample and one duplicate collected from this temporary well were nondetect and 1 ug/L, respectively. Therefore, the high concentration of lead in the unfiltered sample is probably related to high levels of suspended solids being present in the temporary well. Lead was only detected in one of three monitoring wells sampled during the Lower Subase RI. Concentrations of lead detected in this sample were 9.7 ug/L (total) and 10.5 ug/L (filtered). Both of these concentrations are below the CTDEP's groundwater protection criteria (15 ug/L). Therefore, the lead remaining in the soil around Building 31 does not seem to be acting as a significant source of contamination to the groundwater.

Please refer to the Responses to General Comments No. 1 and 2.

4 Page ES-16 Section ES.5.3 Baseline Human Health Risk Assessment (Zone 4)

Comment: The text states that beryllium was detected in soil in this zone at a concentration that "exceeds the pollutant mobility criteria but was within background levels". The Navy previously collected soil samples from widely scattered areas on and near the base for the purposes of determining background concentrations of metals. While the data generated by this report may be useful for comparison purposes, it does not constitute a determination of the background concentration for soil. Section 22a-133k-1(a)(6) of the Regulations defines a background concentration for soil as "the representative concentration of a substance in soil of similar texture and composition outside the subject release area and in the general geographic vicinity of such release area, but not within any other release area."

Response: This statement is incorrect. The concentrations of beryllium detected in Zone 4 soil were all below the DEC. No TCLP or SPLP test results are available for beryllium to make a comparison to pollutant mobility criteria. The statement will be removed from the text.

The reviewer's comment regarding base-wide background levels raises concerns that background levels established for NSB-NLON are not appropriate, according to CTDEP regulations, for making risk management decisions at a site. This issue requires further discussion at the upcoming August project meeting. An approach for the use of background levels will be determined and incorporated into revisions of the Lower Subase RI Report.

5 Page ES-19 Section ES.6.4 Recommendations (Zone 5)

Comment: No further action is recommended for soil in this zone. This recommendation is not appropriate since lead and other contaminants were detected at concentrations exceeding the GB pollutant mobility criteria. The Navy notes that lead was detected at concentrations exceeding the pollutant mobility criterion in samples analyzed by TCLP, but not in samples analyzed by SPLP. However, a very limited number of samples was analyzed by SPLP. In addition, lead was detected in catch basin sediments at concentrations as high as 85,600 mg/kg. These lead contaminated sediments constitute a significant potential source of pollution to the waters of the State which must be addressed.

Response: Lead was the only contaminant that was detected at concentrations exceeding the GB pollutant mobility criteria. The other contaminants listed as COCs because of pollutant mobility issues (arsenic, chromium, and nickel) were identified by screening against USEPA SSLs for migration from soil to groundwater.

TCLP results for two soil samples exceeded the CTDEP's pollutant mobility criteria for lead. The samples were collected from the following locations and depths: 19MW2 (4 - 6 feet) and 19SS1 (0 - 0.5 feet). Two borings (TB1-5RI and TB6-5RI) were installed during the Lower Subase RI adjacent to these locations in order to collect soil samples for SPLP analysis and confirm the lead mobility problem. Shallow and deep soil samples were collected from each boring. This approach was detailed in the RI WP. The results of the SPLP for all samples were below the CTDEP's pollutant mobility criteria for lead. In addition, lead was detected infrequently and at low concentrations (i.e., < 15 ug/L) in the groundwater. This data suggests that there is no lead mobility problem. The Navy does not believe that additional soil sampling and analysis is necessary to confirm this issue.

Please refer to the Responses to General Comment No. 6 and Specific Comment No. 3.

The recommendation for Zone 5 will be changed to indicate that this site should proceed to a FS. A tiered monitoring program will be one of the alternatives evaluated in the FS.

6 Page ES-22 Section ES.7.4 Recommendations (Zone 6)

Comment: No further action is proposed for soil. This recommendation is not acceptable since metals, PAHs, and TPH are present in soil at levels exceeding the GB pollutant mobility criteria.

Response: For clarification, concentrations of dibenzo(a,h)anthracene, ideno(1,2,3-cd)pyrene, and TPH detected in Zone 6 soil exceeded the GB pollutant mobility criteria. No concentration of inorganics detected in Zone 6 soil exceeded GB pollutant mobility criteria.

The recommendation for Zone 6 will be changed to indicate that this site should proceed to a FS. A tiered monitoring program will be one of the alternatives evaluated in the FS.

7 Page 1-12 Section 1.3.5 Geology

Comment: The Navy should discuss in this section the presence of older piers and layers of fill beneath the present ground surface. Reportedly fill was placed directly on top of the older piers to raise the ground to its present level. These piers and the associated fill layers are likely to play a significant role in contaminant transport within the Lower Base area.

Response: Text will be included in this section that discusses the presence of old piers and fill material beneath the present ground surface.

8 Page 1-17 Section 1.3.6.3 Comprehensive Water-Level Investigation

Comment: One task which the Navy has yet to accomplish is to determine the elevation of the seasonal high water table. This is important because the pollutant mobility criteria will apply to all soils located above this elevation, while the pollutant mobility criteria will not apply to soils below this elevation.

In the second line of the last paragraph, please replace the word "are" with "is" so that the sentence reads as follows: "...east of NSB is at higher elevations than along the eastern boundary...".

Response: Because a FS has not been completed for this site, the preferred remedial alternative has not yet been determined. When the FS is completed and if it is determined that an invasive remedial alternative is the preferred alternative, a study will be completed to determine the elevation of the seasonal high water table.

The sentence will be changed as recommended.

9 Page 3-49 Section 3.4.3.3 Potential Routes of Exposure

Comment: The Navy states that due to the limited guidance available to estimate exposure to soil via dermal contact, EPA Region 1 recommends performing a quantitative risk assessment for dioxins, PCBs and cadmium only. This statement is inaccurate as Regions 1 Supplemental Risk Assessment Guidance for the Superfund Program (EPA 901/5-89-001, 1989) provides default dermal exposure factors for contaminants in addition to cadmium, dioxins, and PCBs. Please see

Wester *et al* (1990, 1992, 1993). EPA currently recommends quantitative assessment of the risks posed by dermal exposure to PAHs. In addition, the Department requires, to the extent possible, a full quantitative analysis of the dermal risks posed by contaminants. Please see my letter dated April 21, 1998 to the Navy regarding the Navy's application for alternative direct exposure criteria at the Area A Downstream Site (attached).

This statement applies also to Section 4.6.1.3 on page 4-27.

Response: Agreed. The dermal assessment for potential risks for soil exposure will be revised accordingly. New guidance on dermal exposures is expected to be issued by USEPA headquarters in September. USEPA Region I has provided the Navy with information needed to modify the dermal risk assessment. However, it should be noted that the Lower Subase RI Report was based on risk assessment methodologies contained in the Phase II RI Report, as indicated in the associated WP. During the development of the Phase II RI Report, the Navy was specifically instructed by USEPA Region I to evaluate dermal soil risks for PCBs, dioxins, and cadmium only.

10 Page 3-83 Section 3.5.4.2 Risk Calculation- Other Risk Considerations

Comment: In the second paragraph of this page the Navy states that when HQs exceed the most conservative guidelines, less conservative guidelines are presented. This may be appropriate as long as the more conservative guidelines are also presented. However, it would not be appropriate to present only the less conservative guidelines.

Response: Agree. The most conservative guidelines were used initially in the ERA. Less conservative guidelines were presented only when the most conservative guidelines were exceeded.

11 Page 3-100 Table 3-7 Footnote 7

Comment: The Navy should present the most recently adopted version of the Water Quality Standards. The most recent Surface Water Quality Standards became effective April 8, 1997.

Response: Agree. The most recent Surface Water Quality Standards (effective April 8, 1997) will be included and referenced in Table 3-7.

12 Page 4-16 Section 4.4.2.1 Historical Data (Zone 1)

Comment: The Navy states that 18 metals were detected in Zone 1 filtered ground water samples, while 22 metals were detected in unfiltered ground water samples. However, the occurrence of lead in ground water is not discussed. Please add a discussion regarding lead.

Response: Agree. A discussion regarding lead will be inserted into this section.

13 Page 4-21 Section 4.5.3 Evaluation of Natural Attenuation Data (Zone 1)

Comment: The Navy states in the second paragraph that high concentrations of TPH, indicative of petroleum hydrocarbons, were detected in this zone. The State assumes that the Navy intends to say that the TPH concentrations are indicative of *free phase* petroleum hydrocarbons. Please clarify this statement. The Navy should note that Section 22a-133k-2(g) requires that LNAPLs be

removed to the maximum extent practical. The State would therefore require active removal of free floating petroleum.

Response: For clarification, the text referred to in the comment is discussing soil data and not the presence or absence of free phase petroleum hydrocarbons. No changes to the text are proposed.

Please refer to the Response to General Comment No. 5.

14 Page 4-24 Section 4.6.1.1 Soil Chemicals of Concern (Zone 1)

Comment: The last paragraph on this page refers to the "RSR guidance". This term is incorrect as the Remediation Standard Regulations are not a guidance document. The Remediation Standard Regulations are part of the Regulations of Connecticut State Agencies and were adopted in January 1996. The Department is in the process of drafting a guidance document to accompany the Remediation Standard Regulations. This comment applies also to the last paragraph on page 5-18, to the third paragraph on page 6-21, to the fourth paragraph on page 7-25, to the last paragraph on page 8-20, to the second paragraph on page 9-14, and the second paragraph on page 10-23.

The Navy notes that while lead was detected in soil samples extracted using TCLP, it was not detected in soil samples using SPLP. The Navy states on page 4-25 that the SPLP results "do not support the conclusion that lead is migrating from the site at concentrations of potential concern as previously indicated by the TCLP results". The Navy acknowledges that some uncertainty exists regarding mobility of lead because not all soil samples were analyzed for lead using the SPLP. In fact, only two soil samples were analyzed for SPLP. Two soil samples are not sufficient to be representative of the distribution of lead in soil at the site.

Soil concentrations should also be compared to the direct exposure criteria to select contaminants of concern.

Response: Comment noted. The text referencing the Remediation Standards Regulations will be revised accordingly.

Comment noted. Uncertainty associated with limited SPLP analyses was provided. To emphasize this concern, the text of the report will be revised as follows, "However, it should be noted that SPLP analyses were performed for only two soil samples collected at the site; therefore, there is still some uncertainty regarding the mobility of lead. A discussion of COCs for groundwater is provided in the following subsection."

Disagree. Soil concentrations were compared to the direct exposures criteria in the baseline human health risk assessment (page 4-24).

15 Page 4-26 Section 4.6.1.2 Groundwater Chemicals of Concern (Zone 1)

Comment: The Navy states in the third paragraph that the "appropriate alterative Connecticut Surface Water Protection Criteria (SWPC) for this site would be the salt water WQSs with a dilution factor of 10 applied. This statement does not accurately portray the requirements of the Remediation Standard Regulations. Section 22a-133k-3(b)(3) of the Regulations provides two alternative methods for calculating alternative surface water protection criteria. However, alternative surface water protection criteria may not be derived by simply multiplying the Numerical Water Quality Standards by a ten fold dilution factor.

This statement applies also to the third paragraph on page 4-32, to the second paragraph on page 5-20, to the first paragraph on page 5-26, to the fourth paragraph on page 6-22, to the first paragraph on page 6-28, to the third paragraph on page 7-27, to the first paragraph on page 7-34, to the first paragraph on page 8-22, to the fourth paragraph on page 8-26, to the fourth paragraph on page 9-15, to the last paragraph on page 9-19, to the fourth paragraph on page 10-24, and to the last paragraph on page 10-31.

Response: Please refer to the Response to Specific Comment No. 2.

16 Page 4-31 Section 4.7.2 Contaminant Fate and Transport (Zone 1)

Comment: The Navy states that natural attenuation is feasible for soil and ground water in this zone. While natural attenuation may be appropriate for addressing the petroleum and SVOCs in soil, it will not address the lead and other inorganic contaminants present in the soil. More active remedial measures may be needed to deal with the inorganic contaminants. This comment applies also to the first paragraph on page 5-25, the first paragraph on page 6-27, the first paragraph on page 7-33, the last paragraph on page 8-25, the first paragraph on page 9-19, and the fourth paragraph on page 10-30.

Response: Comment noted. Please refer to the Response to Specific Comment No. 1.

17 Page 4-32 Section 4.7.4 Recommendations (Zone 1)

Comment: The proposed feasibility study should also examine whether the use of institutional controls would be appropriate at this site in the event that contaminated soil must be left in place. The feasibility study should define the specific types of institutional controls which might be appropriate, such as notations to the base master plan, the use of the base excavation permit system, etc.

Response: Agree. A statement will be added to the recommendations indicating that institutional controls should be evaluated in the FS.

18 Page 5-10 Section 5.4.1.2 Deep Soil (Zone 2)

Comment: The Navy notes that lead was not detected in soil samples analyzed for lead using the SPLP procedure. However, lead was detected at a concentration of 3.43 mg/l in one soil sample analyzed by TCLP. Only three soil samples were analyzed by TCLP, while three others were analyzed by SPLP. Three samples analyzed by either method is not sufficient to be representative of the distribution of lead in soil. However, the detection of lead at a concentration of 3.43 mg/l in one soil sample suggests that significant concentrations of lead remain in soil at the site.

Response: The recommendations for Zone 2 will be changed to indicate that a FS should be performed for this site. Additional sampling and analysis of soil in the vicinity of 13MW10, 13MW11, and 13TB11 is necessary to confirm the mobility of lead. A data gap investigation may be completed as part of the FS. The soil samples will be analyzed by the SPLP.

In addition, a tiered monitoring program will be one of the alternatives evaluated in the FS. The proposed monitoring program for Zone 2 will verify or disprove the potential contaminant migration problem.

19 Page 5-13 Section 5.4.2.2 Lower Subase RI (Zone 2)

Comment: The Navy notes that the reporting limit for TPH in groundwater was greater than the groundwater protection criteria of 500 µg/l. On Drawing 12, the Navy shows all samples where TPH was not detected as one half of the detection limit. The Navy notes that the values shown (500 to 600 µg/l) are just above the Connecticut remediation criteria. The Navy concludes on this basis that TPH contamination in Zone 2 shallow soils most likely has not impacted groundwater. This statement is not accurate and must be revised. The only conclusion that can be drawn from this data is that TPH is not present in the five ground water samples at concentrations above the detection limit. Since the detection limits were considerably higher than the groundwater protection criterion, it is not possible to conclude that groundwater has not been impacted by TPH in soil.

Response: Agree. This statement is speculative and will be removed. The statement was made with the knowledge that the primary SVOCs associated with fuel oil (primary contaminant of concern for this zone) were not detected in the groundwater.

20 Page 5-15 Section 5.5.3 Evaluation of Natural Attenuation Data ¶2 (Zone 2)

Comment: The Navy states that moderate to high concentrations of TPH, indicative of petroleum hydrocarbons, were detected in this zone. The State assumes that the Navy intends to say that the TPH concentrations are indicative of *free phase* petroleum hydrocarbons. Please clarify this statement. The Navy should note that Section 22a-133k-2(g) requires that LNAPLs be removed to the maximum extent practical. The State would therefore require active removal of free floating petroleum.

Response: Please refer to the Responses to General Comment No. 5 and Specific Comment No. 13.

21 Page 5-17 Section 5.6.1 Data Evaluation ¶1 (Zone 2)

Comment: Please correct the reference in the third sentence to Zone 1 soils. Table 5-14 actually summarizes COCs for Zone 2.

Response: Agree. The reference will be changed from Zone 1 to Zone 2.

22 Page 5-18 Section 5.6.1.1 Soil Chemicals of Concern (Zone 1)

Comment: The last paragraph on this page refers to the "RSR guidance". This term is incorrect as the Remediation Standard Regulations are not a guidance document. The Remediation Standard Regulations are part of the Regulations of Connecticut State Agencies and were adopted in January 1996. The Department is in the process of drafting a guidance document to accompany the Remediation Standard Regulations.

The Navy notes that while lead was detected in soil samples extracted using TCLP, it was not detected in soil samples using SPLP. The Navy acknowledges that some uncertainty exists regarding mobility of lead because not all soil samples were analyzed for lead using the SPLP. In fact, only three soil samples were analyzed using each of the two methods. Three soil samples

analyzed by either method are not sufficient to be representative of the distribution of lead in soil at the site.

Response: Please refer to the Response to Specific Comment No. 18.

Comment noted. Uncertainty associated with limited SPLP analyses was provided. To emphasize this concern, the text of the report will be revised as follows, "However, TCLP/SPLP analyses were performed for only three soil samples collected at the site; therefore, there is still some uncertainty regarding the mobility of inorganics."

23 Page 5-19 Section 5.6.1.2 Groundwater Chemicals of Concern (Zone 2)

Comment: The Navy states in the second paragraph that lead concentrations in filtered ground water samples were less than the direct exposure criteria. This statement should be omitted since the direct exposure criteria do not apply to ground water.

Response: Disagree. For groundwater, the term "direct exposure criteria" is used throughout the baseline human health risk assessment to refer to risk-based screening levels for direct contact (i.e., USEPA Region III COC screening levels for tap water, Federal and state Maximum Contaminant Levels (MCLs), Connecticut RSRs for the protection of groundwater, etc.). The screening levels used for groundwater are defined in Section 3.4.1.1, beginning on page 3-34 (bottom of page). An explanation of the two types of COCs identified in the risk assessment, direct exposure COCs and additional COCs based on migration, is presented on page 3-31, third paragraph.

24 Page 5-26 Section 5.7.4 Recommendations (Zone 2)

Comment: No further action is recommended for soil in this zone. However, several contaminants remain in soil at concentrations exceeding the pollutant mobility criteria. The Navy will be required to comply with the Remediation Standard Regulation requirements regarding pollutant mobility.

Response: Please refer to the Response to Specific Comment No. 18.

25 Page 6-13 Section 6.4.2.2 Lower Subase RI (Zone 3)

Comment: The Navy notes that the reporting limit for TPH in groundwater was greater than the groundwater protection criteria of 500 µg/l. On Drawing 12, the Navy shows all samples where TPH was not detected as one half of the detection limit. The Navy notes that the values shown (500 to 600 µg/l) are just above the Connecticut remediation criteria. The Navy concludes on this basis that TPH contamination in Zone 3 shallow soils most likely has not impacted groundwater. This statement is not accurate and must be revised. The only conclusion that can be drawn from this data is that TPH is not present in the ground water samples at concentrations above the detection limit. Since the detection limits were considerably higher than the groundwater protection criterion, it is not possible to conclude that groundwater has not been impacted by TPH in soil.

Response: Agree. This statement is speculative and will be removed. The statement was made with the knowledge that the primary SVOCs associated with fuel oil (primary contaminant of concern for this zone) were not detected in the groundwater.

26 Page 6-18 Section 6.5.3 Evaluation of Natural Attenuation Data (Zone 3)

Comment: The Navy states in the second paragraph that high concentrations of TPH, indicative of petroleum hydrocarbons, were detected in this zone. The State assumes that the Navy intends to say that the TPH concentrations are indicative of *free phase* petroleum hydrocarbons. Please clarify this statement. The Navy should note that Section 22a-133k-2(g) requires that LNAPLs be removed to the maximum extent practical. The State would therefore require active removal of free floating petroleum.

Response: Please refer to the Responses to General Comment No. 5 and Specific Comment No. 13.

27 Page 6-28 Section 6.7.4 Recommendations (Zone 3)

Comment: Soil contaminants are present at concentrations exceeding both the direct exposure and pollutant mobility criteria. However, the Navy recommends no further action for soil in this zone. This recommendation is not acceptable as the Navy will be required to comply with the Remediation Standard Regulation requirements regarding direct exposure and pollutant mobility. The State is particularly concerned about the lead concentrations remaining in soil in the vicinity of Building 31.

This recommendation is not consistent with the Navy's recommendation to perform a feasibility study in Zone 4. The Navy speculates that one possible source for lead contamination in Zone 4 is lead which has migrated from the vicinity of Building 31 in Zone 3.

Response: Please refer to the Response to General Comment No. 2. All ARARs will be considered during the FS.

28 Page 7-13 Section 7.4.1.1 Shallow Soil (Zone 4)

Comment: Lead was detected a concentrations exceeding the GB pollutant mobility criteria in soil samples analyzed using both TCLP and SPLP. The Navy notes that the SPLP samples were not collected from the same areas as the TCLP samples, so the results cannot be correlated. Regardless of whether the results can be correlated, the results indicate that further evaluation of lead concentrations is needed.

Response: To clarify, lead was detected at concentrations exceeding GB pollutant mobiiity criteria in only soil samples analyzed using TCLP. All of the recent SPLP results were below the 0.15 mg/L criteria.

The soil samples collect for the Lower Subase RI that were analyzed by SPLP were not from the same area as the historic samples that were analyzed for TCLP. Additional sampling and analysis of soil is necessary to confirm the mobility of lead. A data gap investigation will be completed as part of the FS. The soil samples will be analyzed by the SPLP. The lead mobility issue will be addressed in the FS for this site. All ARARs will be considered during the FS.

29 Page 7-19 Section 7.4.2.2 Lower Subase RI (Zone 4)

Comment: The Navy notes that the reporting limit for TPH in groundwater was greater than the groundwater protection criteria of 500 µg/l. On Drawing 12, the Navy shows all samples where TPH was not detected as one half of the detection limit. The Navy notes that the values shown

(500 to 600 µg/l) are just above the Connecticut remediation criteria. The Navy concludes on this basis that TPH contamination in Zone 4 shallow soils most likely has not impacted groundwater. This statement is not accurate and must be revised. The only conclusion that can be drawn from this data is that TPH is not present in the ground water samples at concentrations above the detection limit. Since the detection limits were considerably higher than the groundwater protection criterion, it is not possible to conclude that groundwater has not been impacted by TPH in soil.

Response: Agree. This statement is speculative and will be removed.

30 Page 7-22 Section 7.5.3 Evaluation of Natural Attenuation Data ¶2 (Zone 5)

Comment: The Navy states that high concentrations of TPH, indicative of petroleum hydrocarbons, were detected in this zone. The State assumes that the Navy intends to say that the TPH concentrations are indicative of *free phase* petroleum hydrocarbons. Please clarify this statement. The Navy should note that Section 22a-133k-2(g) requires that LNAPLs be removed to the maximum extent practical. The State would therefore require active removal of free floating petroleum.

Response: Please refer to the Responses to General Comment No. 5 and Specific Comment No. 13.

31 Page 7-33 Section 7.3.3 Baseline Human Health Risk Assessment (Zone 4)

Comment: The text states that beryllium was detected in soil in this zone at a concentration that "exceeds the pollutant mobility criteria but was within background levels". The Navy previously collected soil samples from widely scattered areas on and near the base for the purposes of determining background concentrations of metals. While the data generated by this report may be useful for comparison purposes, it does not constitute a determination of the background concentration for soil. Section 22a-133k-1(a)(6) of the Regulations defines a background concentration for soil as "the representative concentration of a substance in soil of similar texture and composition outside the subject release area and in the general geographic vicinity of such release area, but not within any other release area."

Response: Please refer to the Response to Specific Comment No. 4.

32 Page 8-1 Section 8.1.1 Site 22 - Pier 33 (Zone 5)

Comment: The text states that this zone includes Pier 33, Building 175, and approximately 800 feet of additional property. Please clarify the meaning of "800 feet". Does this mean 800 square feet, or 800 lineal feet along the river?

Response: The measurement is referring to lineal feet. The measurement is incorrect and should be 400 lineal feet. The text of Sections 8.1 and 8.1.1 will be corrected.

33 Page 8-13 Section 8.4.2.2 Lower Subase RI (Zone 5)

Comment: The Navy notes that the reporting limit for TPH in groundwater was greater than the groundwater protection criteria of 500 µg/l. On Drawing 12, the Navy shows all samples where

TPH was not detected as one half of the detection limit. The Navy notes that the values shown (500 to 600 µg/l) are just above the Connecticut remediation criteria. The Navy concludes on this basis that TPH contamination in Zone 5 shallow soils most likely has not impacted groundwater. This statement is not accurate and must be revised. The only conclusion that can be drawn from this data is that TPH is not present in the ground water samples at concentrations above the detection limit. Since the detection limits were considerably higher than the groundwater protection criterion, it is not possible to conclude that groundwater has not been impacted by TPH in soil.

Response: Agree. This statement is speculative and will be removed.

34 Page 8-17 Section 8.5.3 Evaluation of Natural Attenuation Data ¶2 (Zone 5)

Comment: The Navy states that high concentrations of TPH, indicative of petroleum hydrocarbons, were detected in this zone. The State assumes that the Navy intends to say that the TPH concentrations are indicative of *free phase* petroleum hydrocarbons. Please clarify this statement. The Navy should note that Section 22a-133k-2(g) requires that LNAPLs be removed to the maximum extent practical. The State would therefore require active removal of free floating petroleum.

Response: Please refer to the Responses to General Comment No. 5 and Specific Comment No. 13.

35 Page 8-26 Section 8.7.4 Recommendations (Zone 5)

Comment: No further action is recommended for soil in this zone, despite the presence of contaminants at concentrations exceeding both the direct exposure and pollutant mobility criteria. The Navy will be required to comply with the Remediation Standard Regulation requirements regarding direct exposure and pollutant mobility. The State is particularly concerned about the TPH in the soil around the tank south of Building 175, as well as lead contaminated sediments in the catch basins.

Response: Please refer to the Response to General Comment No. 1 regarding compliance with State RSRs and further action at this zone.

Please refer to the Response to General Comment No. 6 regarding contaminated sediments in catch basins.

36 Page 9-8 Section 9.4.2 Groundwater (Zone 6)

Comment: The Navy notes that the reporting limit for TPH in groundwater was greater than the groundwater protection criteria of 500 µg/l. On Drawing 12, the Navy shows all samples where TPH was not detected as one half of the detection limit. The Navy notes that the values shown (500 to 600 µg/l) are just above the Connecticut remediation criteria. The Navy concludes on this basis that TPH contamination in Zone 6 shallow soils most likely has not impacted groundwater. This statement is not accurate and must be revised. The only conclusion that can be drawn from this data is that TPH is not present in the five ground water samples at concentrations above the detection limit. Since the detection limits were considerably higher than the groundwater protection criterion, it is not possible to conclude that groundwater has not been impacted by TPH in soil.

Response: Agree. This statement is speculative and will be removed.

37 Page 9-11 Section 9.5.3 Evaluation of Natural Attenuation Data ¶2 (Zone 6)

Comment: The Navy states that high concentrations of TPH, indicative of petroleum hydrocarbons, were detected in this zone. The State assumes that the Navy intends to say that the TPH concentrations are indicative of *free phase* petroleum hydrocarbons. Please clarify this statement. The Navy should note that Section 22a-133k-2(g) requires that LNAPLs be removed to the maximum extent practical. The State would therefore require active removal of free floating petroleum.

Response: Please refer to the Responses to General Comment No. 5 and Specific Comment No. 13.

38 Page 9-17 Section 9.6.3.2 Carcinogenic Risks (Zone 6)

Comment: The text notes that the cancer risk estimates for benzo(a)pyrene and arsenic exceeded 1E-6. Please specify the estimated risks for these two chemicals.

Response: The text will be revised to include the cancer risks for benzo(a)pyrene and arsenic, which are 2.3E-6 and 2.2E-6, respectively.

39 Page 9-20 Section 9.7.4 Recommendations (Zone 6)

Comment: No further action is recommended for soil in this zone, although contaminants are present at concentrations exceeding both the direct exposure and pollutant mobility criteria. The Navy will be required to comply with the Remediation Standard Regulation requirements regarding direct exposure and pollutant mobility.

Response: Please refer to the Response to General Comment No. 1 regarding compliance with State RSRs and further action at this zone.

40 Page 10-12 Section 10.4.1.2 Deep Soil (Zone 7)

Comment: The Navy notes that the results of recent analysis for lead using SPLP "do not support the results of the historical TCLP analyses". However, only three soil samples were analyzed for lead using SPLP. Three soil samples is not a sufficient quantity to accurately delineate the distribution of lead in soil in Zone 7. The Navy cannot conclude, based on the results of the three SPLP samples, that lead contamination is not present at levels in excess of the GB pollutant mobility criterion.

Response: The Navy agrees that there is a lead contamination problem in the soil of Zone 7. The recommendation for this zone is to proceed to a FS. Alternatives that address the lead contamination will be developed and evaluated in the FS.

41 Page 10-16 Section 10.4.2.2 Lower Subase RI (Zone 7)

Comment: The Navy notes that the reporting limit for TPH in groundwater was greater than the groundwater protection criteria of 500 µg/l. On Drawing 12, the Navy shows all samples where TPH was not detected as one half of the detection limit. The Navy notes that the values shown (500 to 600 µg/l) are just above the Connecticut remediation criteria. The Navy concludes on this basis that TPH contamination in Zone 7 shallow soils most likely has not impacted groundwater. This statement is not accurate and must be revised. The only conclusion that can be drawn from this data is that TPH is not present in the five ground water samples at concentrations above the detection limit. Since the detection limits were considerably higher than the groundwater protection criterion, it is not possible to conclude that groundwater has not been impacted by TPH in soil.

Response: Agree. This statement is speculative and will be removed.

42 Page 10-27 Section 10.6.3.1 Non-carcinogenic Risks (Zone 7)

Comment: The table at the top of the page lists the hazard quotients for manganese and antimony. Should lead be included in this table? If lead is not a significant risk driver, this should be discussed in the text.

Response: Disagree. The table in question discusses target organ effects for those risk drivers contributing to the elevated hazard index for the construction worker. A hazard index could not be calculated for lead since there are no toxicity values available for this chemical. Exposures to lead were evaluated using USEPA's IEUBK model, and the results are presented in Section 10.6.3.3.

43 Page 11-27 Section 11.5 Contaminant Fate and Transport (Thames River)

Comment: The Navy states in the first paragraph that "metals may be soluble in surface water (as a function of pH) but are more likely to remain in dissolved form at near neutral pH. This sentence appears to be incorrect since metals will be mobile if they remain in dissolved form. In fact, mobility of metals tends to increase as pH becomes lower. One would expect that at near neutral pH metals would tend to remain in the soil matrix and would be relatively immobile.

Response: Agree. This sentence will be removed from the report.

44 Page 11-28 Section 11.6.1 Data Evaluation (Thames River)

Comment: The Navy states that exposure to sediment in the river is unlikely. The State agrees that exposure to sediments is unlikely in most of the lower base area. However, exposure to sediments is possible in Goss Cove. Although this report does not address Goss Cove, this fact should be acknowledged in the text.

Response: Disagree. Goss Cove is a semi-isolated water body that is not considered as part of the Thames River. The cove and river are separated by a permeable embankment. Goss Cove is currently being evaluated as a separate site. No additional information regarding Goss Cove will be included in the text of this report.

45 Page 11-99 Section 11.7.8.2 Preliminary Exposure Estimate and Risk Calculation-

Benthic Macroinvertebrates

Comment: In the first paragraph, the Navy makes a distinction between the upper and lower river. Please clarify that this term refers to upstream versus downstream portions of the river, rather than to relative depths.

Response: Agree. The text will be modified to more clearly state that the terms "upper river" and "lower river" refer to the portions of the river inland and near the ocean, respectively, and do not refer to relative depths in the same portion of the river.

46 Page 11-103 Section 11.7.8.3 Conclusions

Comment: In the last sentence, please replace "and" with "after" so that the sentence reads "... after this program has been accepted by the regulatory agencies".

Response: The sentence in question is referring to the conceptual approach of the DRMO monitoring program. The monitoring program for the DRMO was finalized with the approval of the USEPA and issued in February 1998. The program is currently being implemented. The results and duration of the program are still to be determined.

The sentence will be changed as follows:

> "... and the conceptual approach for the program has been accepted by the regulatory agencies."