UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
JOHN F. KENNEDY FEDERAL BUILDING
BOSTON, MASSACHUSETTS 02203-0001

March 20, 1997

Philip Otis
U.S. Department of the Navy
Northern Division - NAVFAC
10 Industrial Highway
Code 1811/PO - Mail Stop 82
Lester, PA 19113-2090

Re: Technical Review of "Minutes from the February 6, 1997 Teleconference Call and Attachments" Dated February 13, 1997, and "Additivity Evaluation for Sites 6, 10, and 11" Dated February 27, 1997, which are intended as an addenda to the Technical Memoranda for Sites 6, 10, and 11, Former Naval Construction Battalion Center, Davisville, RI

Dear Mr. Otis:

Pursuant to § 7.6 of the NCBC Federal Facility Agreement (FFA), the Environmental Protection Agency's (EPA) has reviewed the above referenced documents. Please find our comments enclosed.

Overall, the Navy has been much more responsive to EPA's major concerns that the risks are evaluated on a chemical-by-chemical basis and that a hazard quotient of >10 is used as the risk threshold for individual COCs. However, the Navy has not been as responsive to EPA and Fish and Wildlife concerns that the benchmark screening values used in the risk-based assessment may not be appropriate for the site. The enclosed comments provide more specifics on this issue and other suggestions for improved readability of the document.

Please contact me at (617) 573-5736, if you have any questions concerning this review.

Sincerely,

Christine A.P. Williams
Remedial Project Manager
Federal Facilities Superfund Section

Enclosure

cc: Richard Gottlieb, RIDEM
Walter Davis, NCBC

Tim Prior, USF&WL
Ken Finkelstein, NOAA
George Horvat, Dynamac
Jim Shultz, EA
Greg Tracey, SAIC
Susan Licardi, ToNK
Howard Cohen, RIEDC
Marjory Meyers, Narragansett Indian Tribe
Bryan Wolfenden, RI RC&D, Inc.

Technical Review of "Minutes from the February 6, 1997 Teleconference Call and Attachments" Dated February 13, 1997, and "Additivity Evaluation for Sites 6, 10, and 11" Dated February 27, 1997, which are intended as an addenda to the Technical Memoranda for NCBC Sites 6, 10, and 11 Dated December 6, 1996.

A. BACKGROUND

The draft final phase of a comprehensive, watershed-based Final Draft Freshwater/Terrestrial Ecological Risk Assessment (ERA) is available for the Naval Construction Battalion Center (NCBC) at Davisville, Rhode Island (EA 2/96). The Navy believes that the information in the ERA can be used to make site-specific risk-based assessments and remedial decisions at NCBC, and has submitted site-specific risk-based assessments for the surface soil at Site 6 (Hall Creek watershed), Site 10 (Hunt River/Frenchtown Brook watershed), and Site 11 (Mill Creek watershed). EPA, USFWS, and RIDEM submitted their written reviews of these assessments to the Navy in early January. A teleconference took place between representatives from the Navy and their contractor EA Engineering, the EPA and their contractor Dynamac, USFWS, and RIDEM on February 6, 1997. In response to the written and verbal comments concerning the risk-based assessments for Sites 6, 10, and 11, the Navy has submitted two documents containing additional information about the COPCs in the surface soil at Sites 6, 10, and 11.

Document 1, received by fax on February 13, 1997, includes:

- Minutes of the teleconference of 6 February
- Narrative descriptions of the technical basis of benchmark values for Sites 6, 10, and 11
- Narrative Description of "New" COPC for Sites 6, 10, and 11
- Table of COPCs detected at Sites 6, 10, and 11 with HQs≥1
- Composite list of chemicals for mode of action/target organ literature search

Document 2, received by fax on February 27, 1997, includes:

- Additivity Evaluation for Sites 6, 10, and 11

B. GENERAL COMMENTS (Including Remarks Regarding the Teleconference)

The following general concerns were raised during the review of the risk-based assessment Technical Memoranda (TM) for Sites 6, 10, and 11: that risks are evaluated on a chemical-by-chemical basis; that a hazard quotient of ≥10 is used as the risk threshold for individual COPCs; and that it is uncertain if the benchmark screening values used in the risk-based assessments are appropriate for the site.

During the February 6 teleconference, the Navy agreed to:

- Provide additional discussion on the technical basis of each screening value used in Step 4.
- Give greater weight to background soil concentrations in Step 4 during the validation of

the risk drivers at the sites, with relative priority for background data sets being NCBC-specific, Rhode Island, and eastern US.
Provide additional discussion/rationale in the technical memoranda document as to why an HQ of 10 was selected as the risk threshold.
Provide information on the target organs, mode of action, and additivity potential for COPCs with HQs≥1.
Provide "several pages" of additional discussion/rationale in the TM as to why the additional COPC are not problematic and that modeling/calculating HQs for these chemicals would probably be unnecessary.
Recalculate risks from DDT to avian receptors. The TRV for DDT (Opresko 1994) used in the ERA report (0.00028 mg/kg/day) was an error in the original technical report. The corrected value (Opresko 1995) is 0.0028 mg/kg/day.
Include in the TM a comment that TRVs for terrestrial receptors represent a sizable source of uncertainty in ecological risk assessments.
The above issues are to be addressed in the Technical Memoranda because the issues raised are currently under discussion at the site-specific level.

The Navy has made significant efforts to address these concerns. They have provided descriptions of the sources of the screening values; a discussion of the additional COPCs, including comparisons to benchmark values; and information on the target organs, mode of action, and additivity potential for COPCs with HQs≥1 found at Sites 6, 10, and 11. However, some minor issues have not been resolved in the newly submitted documents. Some corrections to the new text are needed. There are some technical issues on which additional elaboration is warranted, and the Technical Memoranda and the faxed addenda need to be integrated into a single document.

C. DOCUMENT 1

C1. Narrative Descriptions of the Technical Basis of Benchmark Values

These descriptions are to be inserted at Step 4 of the risk-based assessment for each of the three site-specific Technical Memoranda. In Step 4 of the risk-based assessment, it is determined if the watershed risk drivers are present in the surface soil. If they are present, then the concentration of each compound is compared to benchmark data to determine if the compounds are present in unacceptably high concentrations. These benchmarks must be shown to be applicable to the site.

Comments regarding the Narrative Descriptions

1. Site 6 - In an E-mailed comment from Christine Williams, it was stated that NOAA has not adopted the Quebec Ministry of the Environment value for cadmium.

Therefore, the statement that this value has been adopted by NOAA should be removed from the description. NOAA reference cards are not adaptation of various values by NOAA and the Navy should reference the source of all values used.

2. The site specific ecological significance of the Oak Ridge earthworm screen should be very briefly (one or two sentences) discussed. This is especially important since the earthworm screens tend to be one or more orders of magnitude greater than other screening values.

3. A more detailed description of the Rhode Island background data is needed. Specifically, how extensive was the sampling (xx samples throughout all parts of the state) and what types of sites fit the description of background. Sufficient information about the Rhode Island background data should be provided to demonstrate that data from an entire state is pertinent to these sites.

4. For Site 6, the Rhode Island background range for the COPC is used as a benchmark value. For Sites 10 and 11, the "maximum background" and "upper limit background" are used as benchmark values. The same type of data should be used for the three sites. The background range is more informative than the background maximum; the range and a mean or median would be ideal.

5. For Site 10, the Oak Ridge plant screen is listed as 5.0 mg/kg with unspecified toxic effects. Since this value is not a NOEL, and without further details about the magnitude of the toxic effects, this does not appear to be a good benchmark screen. The Navy should either obtain the original document and define magnitude of the toxic effects or drop this source from the screen. Again the benchmarks should be applicable to the site.

General Comments Regarding Revision of Step 4

One of the significant failings of Step 4, even with these narrative descriptions attached, is the lack of detailed information about concentrations of any COPCs at the site and the lack of any information about NCBC background values. There is too great a dependance on the reviewer having access to the Freshwater/Terrestrial Ecological Risk Assessment. Step 4 should include:

- the minimum, maximum, and mean concentrations of the COPC, and number of hits/number of samples in the surface soil at the site.
- the minimum, maximum, and mean background concentrations in NCBC surface soil. It was agreed in the teleconference that greatest weight in determining potential risk would be placed upon the relation of the concentration of the COPC in the surface soil at the site and NCBC background.

All discussion about the risks presented at the site should be weighted toward comparing site values to site-specific and Rhode Island background values.

C2. Narrative Description of "New" COPCs

Relevant descriptions in this section are to be appended to the risk-based assessment for each of the three site-specific Technical Memoranda. For expediency, this approach has been adopted in lieu of requiring the Navy to calculate watershed-wide HQ values for these metals, since these compounds do not appear to pose an ecological risk at these sites. The decision to append these descriptions to the TM does not negate the need to correct relevant sections of the ERA.

General comments about the Narrative Descriptions

1. The first two paragraphs of each of these sections is misleading. The first paragraph describes the initial screening of maximum on-site concentration against three times the mean site-specific (NCBC) background level and states that this background comparison is conservative. The second paragraph states that a second screening of maximum on-site concentrations against mean site specific background concentrations was done to detect hot spots. The EPA maintains that the Navy was instructed to compare maximum on-site values against the mean site-specific background in the NCBC ERA, and that the screening of the maximum on-site concentration against three times the mean site-specific (NCBC) background level in the ERA was **incorrect**. Therefore, the second screening was done to bring the risk assessment in line with standard procedures and to negate the need to revise the ERA in response to the community's need for expedited transfer of the base. The description of the screening methods should not imply that the initial screening was correct. The document should simply state that the screening was initially done against three times background in the ERA, and then, at the request of the EPA, against mean background, with **no editorial comment** attached to either screening method.

2. In paragraph 3, the phrase "...probably don't represent significant ecological risk for the following reasons..." should be reworded. "Probably" does not inspire confidence in the evaluation of the data. Be specific.

3. The benchmark screening values used for these COPCs are from Shacklette and Boerngen (1984), and are identified as the background concentration of the metals in soil in the United States. It was generally agreed among the EPA, USFWS, and NOAA representatives during the teleconference that data for the entire US have little relevance to the NCBC site. Site data should be compared to Rhode Island background values after comparison to NCBC Background. If the data for these

five metals (aluminum, barium, copper, nickel, and vanadium) are not available through RIDEM, the state Department of Agriculture or state soil testing laboratory should be contacted.

4. For all five new COPCs, the discussion about these compounds, their concentrations, and potential risks is insufficient. Since HQ values for the new COPCs were not calculated, a more detailed discussion than that currently presented is warranted. In addition, the discussions should be specific to the surface soil at the site, not to the watershed in which the site is located.

   These discussions should be similar to those requested for Step 4 of the risk-based assessment TM. They should include the minimum, maximum, and mean concentrations in the surface soil at the site; the minimum, maximum, and mean site-specific background values; RI background values; and several general comments about their availability and toxicity, e.g., "Aluminum is one of the most common elements in soil and exists in several chemical states. A relatively small fraction (X-Y%) of the total aluminum content of the soil exists in a form that can be absorbed by and is toxic to plants and animals. Aluminum must be present in the soil at very high concentrations to cause a toxic response in animals." The Navy may want to consult one or more of the sources that were used in the Additivity Evaluation for information about these compounds.

5. For aluminum, the discussion should include some comment about aluminum toxicity to plants, since with aluminum the reduction of plant growth is of equal or greater concern than toxicity to animals.

6. The discussion of chromium as a COPC in these sections is not needed, since with the ECO TOX Update screening value of 81 ppm, chromium is not a COPC. However, the COC screening tables in the ERA must be updated in the final document to include the new value.

7. In the faxed copy, the discussion of vanadium includes a reference to the background concentration of aluminum and is incomplete. This does not affect this review, but must be corrected for the final TM.

C3. COPCs Detected at Sites 6, 10, and 11 With HQs≥1

This list of COPCs with watershed HQs≥1 that are also present in the surface soil at sites 6, 10, or 11 was provided to identify COPCs that would be researched for additivity evaluations.

1. This information should be included in the risk-based assessment TM for each site. The screening method by which these compounds were identified as COPCs (maximum against three times site-specific background mean) should be noted to avoid confusion with the "new COPCs".

2. It does not appear that this list reflects the corrected TRV for DDT. The TRV for DDT (Opresko 1994) used in the ERA report (0.00028 mg/kg/day) was incorrect in the original Opresko report. The correct TRV value should be 0.0028 mg/kg/day.

3. Based on the information provided in the Additivity Evaluation for these sites, the HI for "Total PAHs" should be included where appropriate. The Total PAH value should be for all PAHs at the site, not just PAHs with HQs≥1.

C4. Composite List of Chemicals for Mode of Action/Target Organ Literature Search

Comments on this section have been superseded by submission of the results of the literature search.

D. DOCUMENT 2

Additivity Evaluation for Sites 6, 10, 11

1. This information on the toxicity of compounds with HQ values ≥1 should be appended to Step 2 in the risk-based assessments as part of a discussion justifying evaluation of COPCs on a chemical-by-chemical basis and on the selection of an HQ of 10 as the risk threshold.

2. It should be noted in the additivity evaluation that this discussion only concerns those COPCs identified by comparing maximum watershed values against three times the site-specific background means.

3. Because of the potential additivity of the PAHs, the HI for "Total PAHs" should be presented and, if ≥10, discussed in the risk-based assessment TM for these sites.

4. Because of the potential additivity of aldrin and dieldrin, it should be noted in the text that both aldrin and dieldrin are present in the surface soil only at Site 11, and that in the Site 11 (Mill Creek) watershed, the summed values are <2.5 for all receptors.

5. No toxicity data were included for cobalt, copper, iron, or molybdenum. If no data were found, this should be noted in the text.

E. CONCLUSIONS

In summary, much of the information that the Navy agreed to provide in the February 6 teleconference has been submitted. The current status of the major issues addressed in the teleconference is as follows:

The Navy agreed to provide additional discussion on the technical basis of each screening value used in Step 4.

The Navy has provided a description of the sources of all screening values. Additional information is needed on the Oak Ridge earthworm screen, the Rhode Island background data, and the Oak Ridge plant screen to demonstrate that these values are pertinent to the sites. Some minor changes in the information as presented are required.

Give greater weight to background soil concentrations in Step 4 during the validation of the risk drivers at the sites, with relative priority for background data sets being NCBC-specific, Rhode Island, and eastern US.

The Navy has not provided revisions of Step 4 giving greater weight to background soil concentrations.

Provide additional discussion/rationale in the technical memoranda document for why an HQ of 10 was selected as the risk threshold.

No discussion has been provided to justify the use of an HQ of 10 as the risk threshold. As part of this discussion, the toxicology information for chemicals with HQs≥1 can be appended to the TM and referred to with brief discussion in Step 2. However, some additional discussion is warranted in Step 2. This discussion should include information that is generally included in discussion of the uncertainties associated with risk assessments, including the limited availability of many compounds detected in soil and the conservative nature of the TRVs.

Provide information on the target organs, mode of action, and additivity potential for COPCs with HQs≥1.

The Navy has researched the target organs, modes of action, and additive/synergistic effects of COPCs that have HQs≥1 and are present at Sites 6, 10, or 11. With this information, it is clear that most of the chemicals at the sites can be evaluated individually. However, the risk from total PAHs in the surface

soil should be calculated and addressed, since it is probable that these compounds have additive effects. The possible cumulative risk of aldrin and dieldrin need not be discussed in detail because they are not present at these sites in sufficient quantity to significantly increase the potential risk from the most concentrated of the pair; the HI for these compounds does not approach 10.

Provide "several pages" of additional discussion/rationale in the Technical Memoranda as why the additional COPCs are not problematic and that modeling/calculating HQs for these chemicals would probably be unnecessary.

Some discussion about the new COPCs, their concentrations, and potential risks is presented; however, a more detailed discussion than that currently presented is warranted. In addition, the discussions should be specific to the surface soil at the site, not to the watershed in which the site is located. The benchmark screening values that are used for these COPCs are identified as the background concentrations of the metals in soil in the United States. Site data should be compared to Rhode Island background values.

Recalculate risks from DDT to avian receptors. The TRV for DDT (Opresko 1994) used in the ERA report (0.00028 mg/kg/day) was an error in the original technical report. The corrected value (Opresko 1995) is 0.0028 mg/kg/day.

Corrected data have not been provided. This change impacts the discussion presented in the Site 11 risk-based assessment and should be included in the TM revision.

Include in the TM a comment that TRVs for terrestrial receptors represent a sizable source of uncertainty in ecological risk assessments.

This comment has not been submitted for review. It should be included in the TM revision.

In addition, the information provided to date and that requested in this review should be smoothly integrated into the TM, both as text within the Steps of the risk-based assessments and as addenda. The Navy should reference any data presented in the TM to the relevant pages in the Ecological Risk Assessment, so that the source of all data can be easily located.