



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 1

JOHN F. KENNEDY FEDERAL BUILDING
BOSTON, MASSACHUSETTS 02203-0001

March 24, 1999

James Shafer, Remedial Project Manager
U.S. Department of the Navy
Naval Facilities Engineering Command
Northern Division
10 Industrial Highway
Code 1823, Mail Stop 82
Lester, PA 19113-2090

Re: Draft Old Fire Fighting Training Area Marine Ecological Risk Assessment Report:
Technical Report and Appendices A-D

Dear Mr. Shafer:

I am writing in response to your request for EPA to review the *Draft Old Fire Fighting Training Area Marine Ecological Risk Assessment Report: Technical Report and Appendices A-D* dated February 1999. As outlined in the work plan, the marine ERA is based on a reasonable conceptual model for the site. The ERA also uses several lines of evidence to evaluate possible adverse effects on the marine environment from chemicals originating from the OFFTA. Data from the onshore and offshore should be evaluated together as part of the OFFTA Remedial Investigation to assess contaminant fate and transport. Owing to several discrepancies in the text and tables, it is unclear whether the overall conclusion of the ERA will change once corrected. Detailed comments are provided in Attachment A.

One concern regarding the initial steps of the ERA is that the list of chemicals likely to be associated with the OFFTA is not clearly defined. The ERA included a brief description of chemicals detected in surface soils at the OFFTA, however the description was general in nature and did not clearly indicate which chemicals would be expected to travel via groundwater seeps, past or present erosion, or other routes to marine sediments. In particular, dioxins/furans were detected in surface soil, but do not appear to have been carried into the ERA. Additional information should be provided regarding the chemicals detected in subsurface soil and groundwater in previous investigations of the OFFTA. It would be helpful to include a map indicating where the fire fighting activities took place and prevailing wind and current directions. Such information could provide some basis for determining whether chemicals detected in sediments are likely to have originated at the OFFTA.

The appropriateness of the selected reference stations needs to be discussed further in the ERA. The potential influence of elevated PAHs and some metals owing to the close proximity of the Newport bridge to the reference stations should be discussed. The reference stations to

site stations comparability discussion should include an evaluation of the salinity, dissolved oxygen, and temperature comparability.

There are discrepancies in the derivation of some of the PAH water quality screening values ("WQSVs") used as benchmarks in the ERA for porewater and elutriate hazard quotient development. Most of these discrepancies substantially lower the calculated hazard quotients (*see* Attachment A).

I look forward to working with you and the Rhode Island Department of Environmental Management toward the cleanup of the environs of the Old Fire Fighting Training Area. Please do not hesitate to contact me at (617) 918-1385 should you have any questions or wish to arrange a meeting.

Sincerely,



Kimberlee Keckler, Remedial Project Manager
Federal Facilities Superfund Section

Attachment

cc: Paul Kulpa, RIDEM, Providence, RI
Melissa Griffin, NETC, Newport, RI
Cornell Rosiu, USEPA, Boston, MA
Jennifer Stump, Gannet Fleming, Harrisburg, PA
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Steven Parker, Tetra Tech-NUS, Wilmington, MA
Mary Philcox, URI, Portsmouth, RI
David Egan, TAG recipient, East Greenwich, RI

ATTACHMENT A

<u>Page</u>	<u>Comment</u>
p. 1-1, §1.1	The first sentence of this section is somewhat awkward. Please reword to clarify the intent of the sentence.
p. 1-4, §1.6.1	The second paragraph states, "These exceedances were almost entirely due to PAHs in sediment, which are thought to be derived from fuel burning or asphalt degradation." Since the nature and extent of contamination at the OFFTA has yet to be determined, it is premature to include "asphalt degradation" as the sole source of the PAHs detected in the sediment.
p. 5-56, §5.2.2, & Figure 5.2-4	The last paragraph of this section suggests that most or all of the toxicity observed in the <i>Arbacia</i> larval development tests can be attributed to un-ionized ammonia. This hypothesis is supported by a literature citation containing proposed No Observed Effect Concentration ("NOEC") and Lowest Observed Effect Concentration ("LOEC") values. The toxicity of un-ionized ammonia varies with pH and other site-specific factors. Therefore the evaluation of ammonia toxicity should be supplemented with an evaluation of site-specific data or a toxicity identification evaluation. At station OFF-09, the un-ionized ammonia concentration is 0.231 mg/L, and the IC ₁₀ occurs at 65.0 percent elutriate. Four other stations, OFF-03, OFF-06, OFF-07, and OFF-22, exhibit higher un-ionized ammonia concentrations, but had IC ₁₀ values of greater than 100% elutriate, suggesting that factors other than un-ionized ammonia may be contributing to toxicity.
p. 5-62, §5.3.1.2	The first paragraph specifies the silty subtidal stations sampled north of OFFTA and the silty subtidal stations sampled east of OFFTA in the channel. The total number of silty sites sampled, nine, should be mentioned in the text.
p. 5-64, §5.3.1.2	The second paragraph identifies three sand sampling stations, but twelve sand sampling locations are listed on the data tables (Table 5.3.1B). The text should clearly state the total number of sand locations sampled for this study (n=12).
pp. 5-65 to 5-67,	The <i>Metric Selection and Benthic Community Assessment Protocols</i>

- §5.3.1.2 sections describe the assessment methods used and explains how the sampling stations were compared with reference stations. It may be more appropriate include these sections at the end of Section 5.3.1.1.
- Table 5.3-4. Table 5.3-4 shows the results of fecal pollution indicator evaluation of blue mussels deployed at OFFTA. The overall rankings for several stations are not consistent with the explanation under footnote 5. For station number OFF-13, it is unclear why the overall ranking is low, when the ranking for total coliform and fecal coliform for that station are intermediate. For stations OFF-17, OFF-19, and OFF-23, the overall ranking should be "+." The symbols "+" and "-" should not both be used to describe low exposure.
- p. 6-36, ¶3 This paragraph lists the five sand and silt stations that were determined to have possible benthic impacts. The sites listed on page 6-36 are OFF-01, OFF-03, OFF-05, OFF-06, and OFF-11. However, the sites determined in Section 5.3.1.2 to represent the most likely locations for potential benthic community impacts linked to COCs are OFF-1, OFF-5, OFF-6, OFF-11, and OFF-14. Please clarify. Also, should the text refer to Table 5.3-1 instead of Table 5.3-2?
- p.6-25, §6.3 3.1 The last paragraph states that exposure point concentrations ("EPCs") for prey species are located in Appendix Table A-3. Appendix A-3 contains porewater analysis results, not prey species EPC values. Please change the reference to Appendix A-4.
- p. 6-32, §6.4.2 The second paragraph states that copper and mercury exceed WQCs in the elutriate. According to Table 6.1-3, the metals that exceed WQCs in the elutriate are arsenic, copper, mercury, and nickel.
- p. 6-33, §6.4.2, ¶4 In the discussion regarding dibenzo(a,h)anthracene, PCBs, and p,p'-DDE in elutriate samples, it is indicated that given the absence of definitive exposure-response relationships and conservativeness of the WQCs used, it is apparent that site related COCs are not responsible for observed toxicity, with the exception of dibenz(a,h)anthracene at Station OFF-05. This conclusion needs more supporting information. Site related COCS may be causing some of the lower level toxicity observed at stations other than OFF-05.
- p. 6-33, §6.4.2 The last paragraph on page 6-33 states that in general, the results of the toxicity analysis support the general conclusion that site related COCs are not responsible for observed toxicity of sediments and sediment elutriates with the exception of dibenz(a,h)anthracene at Station OFF-05.

This statement appears to contradict the last sentence of the second paragraph on page 6-33 that states that dibenz(a,h)anthracene is not likely to be responsible for observed toxicity in elutriate. This discrepancy should be addressed.

p. 6-42, ¶1

The last sentence cites Hahn, 1996 when discussing cytochrome p450 activity level thresholds. This reference is not listed in the reference section at the end of the document. All references cited in the text should be listed in the reference section.

p. 6-56, §6.7

Uncertainty in the cytochrome p450 evaluation should be included in the uncertainty analysis. In the ERA discussion regarding the cytochrome p450 analysis it is stated that there is a lowest observed effects concentration ("LOEC") where cytochrome p450 synthesis begins and there is also a maximum observed effects concentration ("MOEC") where the production of cytochrome p450 begins to decrease owing to the toxic effects of the contaminant. According to the footnote in Figure 6.5-8, the LOEC and MOEC values were determined using the results of a study performed by Van Veld *et al.*, (1990). When referring to Van Veld *et al.*, (1990), these thresholds were not directly stated in the results. Although the LOEC value of 3.1 ppm may be derived from the study, the MOEC value of 96 ppm was the highest concentration detected and there is little evidence that cytochrome p450 production decreases above this concentration.

Table 6.0-2

The weight of evidence rankings for tissue residue effects is not clear. Table 6.0-2 shows the indicator-specific and overall weight of evidence rankings for effects characterization including the tissue residue effects ranking. It is stated in this table that a TSC-HQ greater than 40 receives an intermediate ranking and a TSC-HQ greater than the reference concentration receives a high ranking. The presentation of the ranking system for tissue residue effects should be reevaluated and corrected as appropriate

Table 6.1-2b.

This table presents the water quality screening values ("WQSVs") used as benchmarks in the ERA. There are several discrepancies in the table.

The WQSV calculated for high molecular weight ("HMW") PAHs is presented in table 6.1-2b as being 0.29 $\mu\text{g}/\text{L}$. According to the ERA, this value was derived by the equilibrium partitioning method using the K_{oc} values presented in Table 6.1-2a. The high and low molecular weight K_{oc} values are not clearly presented in Table 6.1-2a, as they need to be summed from other values presented in the table. However, when using

the data provided in Table 6.1-2a and the equilibrium partitioning model provided in Section 6.1.2, EPA calculated a WQSV of 0.02 $\mu\text{g/L}$, instead of 0.29 $\mu\text{g/L}$. The K_{oc} value used to calculate the HMW PAH WQSV should be provided and the HMW PAH WQSV should be recalculated and corrected as appropriate.

The WQSV calculated for low molecular weight ("LMW") PAHs is stated as being 5.26 $\mu\text{g/L}$. However, when using the data provided in Table 6.1-2a and the equilibrium partitioning model provided in Section 6.1.2, a WQSV of 0.23 $\mu\text{g/L}$ was calculated. The K_{oc} value used to calculate the LMW PAH WQSV should be provided and the LMW PAH WQSV should be recalculated and corrected as appropriate.

The WQSV calculated for naphthalene is stated as being 620 $\mu\text{g/L}$. According to the WQSV selection process presented in Figure 6.1-1 the WQC-SA value divided by eight should be used before the WQC-FC value. In Table 6.1-2b, however, the WQC-FC value for naphthalene was used instead of the WQC-SA value divided by eight. The WQSV for naphthalene should be changed from 620 $\mu\text{g/L}$ to 294 $\mu\text{g/L}$.

The WQSV calculated for phenanthrene is stated as being 0.81 $\mu\text{g/L}$. According to the WQSV selection process presented in Figure 6.1-1 the first selection should be the WQC-SC value if available. A WQC-SC value is available for phenanthrene, but it was not used in Table 6.1-2b. The WQSV for phenanthrene should be changed from 0.81 $\mu\text{g/L}$ to 4.6 $\mu\text{g/L}$.

The WQSV calculated for total PAHs is stated as being 5.09 $\mu\text{g/L}$. However, when using the data provided in Table 6.1-2a and the equilibrium partitioning model provided in Section 6.1.2, a different WQSV was calculated. The total PAH WQSV should be recalculated and corrected as appropriate.

Table 6.2-4

There is a discrepancy between Appendix D Table D-7-2 and Table 6.2-4 for mercury, copper, and lead. In Table 6.2-4, the CBR values for mercury, copper, and lead are 0.45 $\mu\text{Mol/g}$ dry weight, 1.4 $\mu\text{Mol/g}$ dry weight, and 0.72 $\mu\text{Mol/g}$ dry weight, respectively. However, when CBR HQ values were calculated in Table D-7-2, 0.45 $\mu\text{Mol/g}$ dry weight was the CBR value used for copper, 1.4 $\mu\text{Mol/g}$ dry weight was the CBR value used for lead, and 0.72 $\mu\text{Mol/g}$ dry weight was the CBR value used for mercury. Either the metal names should be changed in Table 6.2-4 or the corresponding CBR values from Table 6.2-4 should be used for the calculation of CBR HQs in Table D-7-2.

The molecular weights for silver and zinc are incorrectly stated as being 109.7 $\mu\text{g}/\mu\text{Mol}$ and 6.7 $\mu\text{g}/\mu\text{Mol}$, respectively. The correct molecular weights are 107.9 $\mu\text{g}/\mu\text{Mol}$ for silver and 65.4 $\mu\text{g}/\mu\text{Mol}$ for zinc.

The values listed under the column titled "CBR Chronic" for mercury (0.72 $\mu\text{Mol/g}$ dry weight) and p,p'-DDE (1.1 $\mu\text{Mol/g}$ dry weight), are not the values that were used to calculate the critical body residue HQs in Appendix D Table D-7-2. It is unclear what values were used for these calculations. These calculations should be checked and the values should be adjusted as appropriate.

In the column titled "CBR Chronic," the values for total PAHs and total PCBs are off by three orders of magnitude when compared to the values calculated in Appendix D Table D-7-2. The values listed in Table 6.2-4 are 0.40 $\mu\text{Mol/g}$ dry weight for total PAHs and 0.20 $\mu\text{Mol/g}$ dry weight for total PCBs. According to the Table D-7-2 calculations, the actual CBR values should be 400 for Total PAHs and 200 for Total PCBs. These calculations should be checked and the values should be adjusted as appropriate.

Table 6.3-2	Table 6.3-2 describes the TRV selection process for the avian aquatic receptors analysis. Footnote 4 provides the equation used to calculate the TRVs (benchmark NOAEL) as being the test species NOAEL multiplied by the cube root of (bw test/bw Roc). However, Section 6.3.3.2 states that the benchmark NOAEL was assumed equal to laboratory (test species) NOAEL on the basis that differences in sensitivity related to body size do not appear to occur. The data in the table concur with Section 6.3.3.2. Therefore, the accuracy and relevancy of footnote 4 is unclear.
Table 6.6-2	Table 6.6-2 provides a summary of effects-based weights of evidence for the ERA investigation. Footnote 2D should refer to Figure 6.5-8.
§§7.0 & 7.4	The conclusions and recommendations presented in these sections may change somewhat after revisions to the ERA are made pursuant to the specific comments.
Appendix A-1	Appendix A-1 presents sediment chemical analysis data. Both grab and core samples were collected. These data are presented for sampling locations OFF-5, -6, -10, -11, and -18. However, the sampling depths are not presented in the table. Although the grab samples can be inferred because SEM/AVS data are presented only for the surface

sediment samples, the table should specify grab or core sample and specify the core depth for which the analysis was run.

Appendix D,
Table D-3-1

Table D-3-1 lists elutriate HQs that were calculated based on the data in Appendix A-2. All of the elutriate HQs for mercury are incorrectly listed as 16.80. According to Appendix A-2, the concentration of mercury detected in all of the elutriate samples was 0.42. To arrive at the HQ, 0.42 is divided by 0.03, the listed WQC-SC. When this calculation is completed, the resulting HQ is actually 14.00. Table D-3-1 should be corrected.

Appendix D

Tables D-5-1, D-5-2, D-5-3, and D-5-4 have a discrepancy for three sampling sites for mercury. Each of the tables show inexplicably high values for mercury in tissue samples taken from *Pitar morrhuana* at sites OFF-14, OFF-15 and OFF-19. According to the data collected from the tissue samples listed in Appendix A-4, the values should be much lower than presented in the Appendix D tables. The values presented for these sampling sites should be reevaluated and the tables should be adjusted as appropriate.

Appendix D

Table D-6-2 contains the tissue screening concentration ("TSC") HQs. The TSC benchmark for lead is incorrectly stated as 64.00. The benchmark for lead from Table 6.2-2 is 0.064. The benchmark for lead should be changed to 0.064 in Table D-6-2 and HQs should be recalculated to reflect the change.

Appendix D

Tables D-7-1a and D-7-1-b must include units for the values presented. Units should be provided with all data tables presented in this report