STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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December 29, 1997

Mr. Fred Evans
Department of the Navy
Northern Division
Naval Facilities Engineering Command
10 Industrial Highway, Mailstop 82
Lester, PA 19113-2090

re: Draft On-shore/Off-Shore Contaminant Fate and Transport Modeling Phase II Work Plan for Portsmouth Naval Shipyard, Kittery, Maine, November 1997

Dear Fred:

The Maine Department of Environmental Protection has reviewed the document referenced above. The Department's comments follow.

General Comment

1) Presently the MEDEP is lacking the required technical expertise to properly evaluate this document, especially Appendix B, Development and Selection of Site-Specific Sediment Kd Values for PNS. However, the MEDEP shares the concerns expressed by NOAA that a relatively simplistic model is being used to model a very complex process that is not well understood, i.e., trace element partitioning between the solid and aqueous phases. The Navy has documented a couple limitations in the derivation of the sediment Kd values. However, the factors affecting trace element partitioning, and the limitations of the model in that context, need to be discussed.

Specific Comments

2) 2.5 Conclusions of the Phase I Modeling, p. 2-10 para 2

"Based on Phase I modeling results, OU5 was not considered a present source of heavy metal contamination to the sediments. This metal contamination in the sediments may be a result of past releases from OU5; or the result of sediment transport by tidal currents from other past or present PNS sources, from the upper estuary, or from other areas of the estuary, as well as from sediment deposition in areas immediately off shore of OU5 because of much weaker current speeds."

The MEDEP expects further evaluation of possible sources of contamination of the sediments at OU5, especially since, as the Navy states, it may be related to other present PNS sources.

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3) 3.3 Development and Application of the Conceptual Model for Phase II Modeling, p. 3-7 para 3

"For organic parameters, in addition to the sediment Kd calculated from PNS data, literature value-based sediment Kd values were also calculated using site-specific fraction of organic carbon (foc)."

Please cite the literature on which these Kd values are based.

4) 3.3 Development and Application of the Conceptual Model for Phase II Modeling, p. 3-13 para 1

"A comparison of the filtered and unfiltered data from low-flow samples for PNS indicates comparable concentrations between filtered and unfiltered samples."

The comparison of these data should be included in the Work Plan.

5) Appendix A, Section 3.0 Results, p. A-4 para 2

a) "The comparison of sediment concentrations with ER-M criteria is provided in Table A-3."

Using the ER-M as the cutoff value for inclusion of a COC may not be appropriate. While concentrations above the ER-M indicate likely toxicity that does not mean that significant toxicity does not exist at concentrations below the ER-M. In the manuscript "Predicting toxicity in marine sediments with numerical sediment quality guidelines"[1] (attached) the authors discuss the incidence of toxicity (using amphipod survival tests, urchin tests, and Microtox tests) from contaminated sediment samples. The authors reported that 53% of 45 sediment samples in which one to four ER-L values were exceeded, but no ER-M values were exceeded. proved to be "highly toxic". 29% of seven samples where only one ER-L value was exceeded (and no ER-M value exceeded), were "highly toxic" (Table 7).

The MEDEP recognizes that these OUs are being evaluated due to the inclusion of COCs that were not dropped from the potential COC list. Nevertheless, further evaluation of the contaminants dropped from the potential COC list as a result of being less than the ER-M may be necessary should modeling with the present COCs result in a "no-action" or "monitoring only" decision.

b) "Except for 4,4'-DDT, the pesticides and PCBs had either a low frequency of detect above the sediment criteria and/or were not detected in seep samples above the surface water criteria."

In some situations it may be possible to have elevated concentrations in the sediment yet low concentrations in the seep water due to gradual accumulation in the sediment from the seep water.

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[1] Long, E.R., L.J. Field, and D.D. MacDonald. 1997. Predicting toxicity in marine sediments with numerical sediment quality guidelines. NOAA manuscript.

In other words, a low concentration in the seep water may result in significant concentrations in the sediment over time. How is this situation taken into account?

6) Appendix B, 2.0 Methodology, p. B-3 para 1

"However, because environmental data sets with sufficient sample size often follow a lognormal distribution, the geometric mean was used for the sediment Kd development."

Please define "sufficient sample size". Are the data sets used to develop Kd values of sufficient sample size?

7) Appendix B, 2.5 Literature Values for Koc, p. B-5 para 3

"The second set used alternative koc values, from a different literature source..."

Although these values are provided in Attachment 4 (B.4) the source of these values is not given. Please provide the citation for these values.

Please feel free to contact me at (207) 287-8010 if you have any questions.

Sincerely,

Iver McLeod
Project Manager
Bureau of Remediation and Waste Management

attachment

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