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DEPARTMENT OF ENVIRONMENTAL PROTECTION

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May 15, 2000

Mr. Fred Evans
Department of the Navy
Northern Division
Naval Facilities Engineering Command
10 Industrial Highway, Mailstop 82
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re: Additional Comments, Draft Final Facility Background Development, Portsmouth Naval Shipyard, Kittery, Maine, March 2000

Dear Fred:

In a letter dated April 27, 2000 the MEDEP indicated it had no further comments on the Draft Final Facility Background Development. However, further review of this document has produced several additional comments. These comments follow.

The subject document provides a statistical analysis of contaminant levels measured in soils and groundwater from presumably unaffected areas of Seavey Island, on which the facility (PNSY) resides. The analysis was to identify contaminant levels representative of "background" for risk assessments of individual sites within PNSY. Upper limit concentrations (e.g., maximum, or the upper 95th percentile confidence limit on the mean) were designated as "representative" for use in subsequent risk assessments. The representative values are to be used for selecting contaminants of potential concern (COPCs) at individual sites.

The Department has one general comment regarding the sampling approach and a number of specific comments on the approach used for analyzing the data. The approach used for the data analysis may be applied to any set of data considered for background contaminant levels. Consequently, comments on the data analysis component are given irrespective of concerns about the approach that was used to obtain the data in the first place (Comment 1, below). A willingness to comment on how the data were evaluated should <u>not</u> be interpreted as approval of the approach that was used to select the facility background sampling locations.

Comments on the document follow.

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General Comment

1. There is an ongoing concern about the choice of sampling locations and the potential for misapplication of the facility background concentrations thus derived. The facility background concentrations should not be considered the same as local anthropogenic background contaminant levels without confirmatory data from neighboring off-island reference locations. Absent data to indicate otherwise, facility background concentrations of some substances may reflect contamination that is typical of the facility, but not the region. Such contaminants may require attention at the facility-wide scale, e.g. petroleum in groundwater. Another is dichlorodiphenyltrichloroethane (DDT) and its metabolites, dichlorodiphenyldichloroethylene (DDE) and dichlorodiphenyldichloroethane (DDD) in soil.

2. Page 2-2, paragraph 2

a) It is mentioned that the maximum concentration of hydrocarbons detected by petroleum hydrocarbon scans of four soil samples was 350 μg/kg. It is assumed that the analysis was for gasoline and diesel range organic compounds (GRO and DRO, respectively). Otherwise, results of the petroleum scan are not consistent with results of analyses for polynuclear aromatic hydrocarbons (PAHs).

b) The standard non site-specific sources of lead are discussed. To these should be added the DRMO, which is an acknowledged source of aerially deposited lead in at least one downwind area (i.e., DRMO impact area).

c) The Navy notes that maximum concentrations of semi-volatile organic compounds and pesticides (with one exception) were less than 5,000 μg/kg. The Navy then argues that the observed concentrations are most likely attributable to common activities for rural and urban areas. The data are insufficient to support this claim for DDT and metabolites.

Pages from the review by the Agency for Toxic Substances and Disease Registry (ATSDR, 1992) are provided as supporting documentation in Appendix B-2. The ATSDR document summarizes data from national monitoring conducted over four years following the 1969 ban on DDT use. According to the ATSDR review, the national average concentration of 4,4'-DDT in soil was 180 μg/kg in 1970, 20 μg/kg in 1972, and 130 μg/kg in 1973. The average concentration of DDE was 50 μg/kg in 1973. In another study reviewed by ATSDR, concentrations of DDT plus DDE in agricultural soils declined from 1,200 μg/kg in 1969 to 390 μg/kg in 1981, while concentrations in neighboring desert soils declined from 400 μg/kg in 1969 to 90 μg/kg in 1981. Concentrations are likely to have declined even further over the more than 20 intervening years. Current concentrations of DDT and metabolites in rural and urban soils are likely to be less than 25% of the concentrations reported in the early 1970s.

Minus one outlier, mean concentrations of DDT and DDE measured in soils from PNSY (respectively, 191 μg/kg and 382 μg/kg) appear to be more consistent with national averages

from the early 1970s than with what is expected for the late 1990s. Absent more recent and/or local data, the argument that concentrations of DDT and metabolites measured at PNSY are typical of rural or urban soils is not valid.

d) The DDE measured at sampling station 14 is highlighted as the one organic compound with a concentration exceeding 5,000 μg/kg. Concentrations of DDT and DDD at station 14, while not greater than 5,000 μg/kg are noticeably elevated compared with other locations. Aside from the implications for data manipulation, concentrations of DDT and metabolites at this location are high (Sum = 11,370 μg/kg) and should be considered a potential hot spot requiring further consideration in the future.

e) Maximum concentrations of individual PAHs did not exceed 5,000 μg/kg (see comment 2c). However, PAHs occur as mixtures, and the summed concentrations exceed 5,000 μg/kg at sample stations 14 (10,756 μg/kg) and 22 (6,586 μg/kg). Station 14 also has noticeably high levels of DDT and metabolites (comment "d"). Soils at station 14 should be considered generally contaminated and unacceptable for consideration as part of background development. This was done for DDT and metabolites, but not for PAHs.

3. Page 2-3.

It is stated that 4-hydroxy-4-methyl pentanone (diacetone alcohol) may be present in soil samples because it is a potential contaminant and/or because it is a byproduct of the sample extraction process. If such is the case, it would seem that diacetone alcohol should be detected in blanks as well.

4. Page 3-2.

a) Eight groundwater samples had detectable levels of GRO or DRO. Measured concentrations of GRO and DRO are considered to be part of the background for the facility. In response, see comment 1.

b) It is noted that facility background concentrations of GRO and DRO will not be used for selecting COPCs in ground water. This implies that some other feature will be used to determine if GRO or DRO are COPCs, which is not the case. It should be clear that GRO and DRO are excluded from the risk assessment for reasons unrelated to their potential for toxicity.

6. Appendix B.2, Page 00048.

Calculations for the upper 95th percentile confidence limit on the lognormally distributed mean includes a questionable factor. The equation is as follows:

$$95^{th}\ UCL = e^{x}$$

$$\text{Where } x = \text{mean} + 0.5(\text{standard deviation})^2 + [\text{standard deviation (critical value)}]/\sqrt{n}$$

This is a standard equation, with the exception of the term "0.5(standard deviation)^2." The source and the meaning of the term in question should be given. Alternatively, the term should be removed from the equation.

Overall, there remains the ongoing concern about the choice of sampling locations and the potential for misapplication of the facility background concentrations thus derived (Comment 1). Results of chemical analyses suggest that soils from one of the background sampling stations have significantly elevated levels of some contaminants and should eventually be evaluated in greater detail (Comment 2d).

Some comments express concerns about how results of chemical analyses were presented in the document (e.g., Comments 2a, 2b, 3 and 4b). Most of these comments are editorial in nature. However, some argue that there are insufficient data to support statements that representative concentrations of some contaminants are typical for rural or urban areas (Comments 1, 2c and 4a). Responses to the latter will eventually require some actions (e.g., additional sampling) to be considered satisfactory.

Aside from one question about a specific calculation (comment 6) the statistical approach used to analyze the data is fairly standard and acceptable. The use of the calculation in question had little impact on the outcome of the analysis currently under review, in part because it was used for only a few of the target analytes. However, the calculation should be explained if the approach used in this report is to be adopted as a standard protocol for studies at PNSY.

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

Sincerely,

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