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March 17, 1997

Florida Department of Environmental Protection
ATTN: John Mitchell
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

RE: Site 38 and OU-2 Remedial Investigation Report, NAS Pensacola
Contract #N62467-89-D-318/0059

Dear Mr. Mitchell:

On behalf of the Navy, EnSafe/Allen & Hoshall is pleased to submit one copy of the response to comments for the Site 38 and OU-2 Remedial Investigation Report at the Naval Air Station Pensacola. If you should have any questions or need any additional information regarding this document, please do not hesitate to call me.

Sincerely,

EnSafe/Allen & Hoshall

Henry H. Beiro, P.G.
Task Order Manager

Enclosure

cc: Bill Hill, SOUTHNAVFACENGCOM - 2 copies
Ron Joyner, **NAS** Pensacola - 2 copies
Gena Townsend, USEPA - **1** copy
Denise Klimas, NOAA - 1 copy
Judeth Walker, NAS Pensacola - 1 copy
EnSafe/Allen & Hoshall File - **1** copy
EnSafe/Allen & Hoshall Library - **1** copy
EnSafe/Allen & Hoshall Pensacola - **1** copy

Final Remedial Investigation Report Site 38
NAS Pensacola, Florida
Response to Department of Environmental Protection Comments

(John Mitchell comments)

COMMENT:

1. In Section 7.0 (Nature and Extent of Contamination), on page 5-7, subsection Establishment of Background indicates the background analytical results for soil and groundwater are in Appendix G. Appendix G only contained hydrologic data. The inorganic reference values are shown in Appendix K, but the background analytical data is missing from the report.

RESPONSE:

The Navy agrees this data was inadvertently left out and will be placed in the appendix for review.

COMMENT:

2. Section 7.2.3 (Summary of Groundwater Contamination at Site 38) indicates that aluminum, iron, manganese and lead exceedences of MCLs may represent ambient conditions. Although some upgradient and side gradient wells had exceedences of primary and secondary drinking water standards, the highest concentrations were located at the source area and in downgradient wells. The secondary standards exceeded for aluminum and iron also exceeded the reference concentration at the source area indicating the site is a likely source or the cause of these analytes releasing from the soil. The exceedences in upgradient and side gradient wells indicates the possibility of another source.

RESPONSE:

The Navy agrees that this statement is an opinion and should be removed from the document. We plan to rewrite this section evidencing an anthropogenic level as defined in RAGS Part A Section 4.4.1.

COMMENT:

3. I have some general comments related to Section 10 (Baseline Risk Assessment). In determining Exposure Point Concentrations, either the 95% UCL or Arithmetic Mean was used based on Supplemental Guidance to RAGS, **EPA** Region IV Bulletin **3** (1995). I believe this was interpreted incorrectly. According to the bulletin, the arithmetic mean is to be used for hot spot areas and only the arithmetic mean of those wells concentrated in the hot spot. The BRA used the arithmetic mean of all detections. Also, the BRA uses the UCL, the arithmetic mean, or the maximum detection value. **This** is mixing two different approaches. It should be one method or the other, not both. Due to the extent of the contaminant plume and exceedences **of** screening values throughout the site area, the 95% UCL should be used or the **maximum** detected concentration if the UCL exceeds the maximum. Please see comments from Dr. Steve Roberts.

RESPONSE:

Groundwater plumes at Site **38** are not clearly defined, and high concentrations were often observed at only one sample location. Consequently, using the arithmetic mean of the highest concentrations as the exposure point concentration would generally be the same as using the maximum reported concentration. RAGS does not recommend using maximum concentrations as exposure point concentrations.

In accordance with USEPA Region N Supplemental Guidance to RAGS, the arithmetic mean concentration was calculated. Since one high concentration does not necessarily define a plume, all detected concentrations were used. The UCL was calculated in accordance with RAGS by assuming undetectable concentrations were present in groundwater samples reported **as** nondetects, therefore different datasets were used to calculate the UCL and arithmetic mean. The UCL was compared to the arithmetic mean, and the arithmetic mean concentration was used if and only if the UCL was greater than the maximum reported concentration. Regardless, risk was estimated for **each sample location and for each chemical of concern.** This is more information than is typically provided in baseline risk assessments, which are usually based on only one exposure point concentration assumed to represent all sample locations in one exposure unit area. The Navy is prepared to map risk at each point providing a better graphical interpretation of the risk

COMMENT:

4. **Also** in Section 10, on page 10-72, the document indicates MCL exceedences for aluminum, iron, manganese, and lead may be from ambient conditions. Please see Comment 2.

RESPONSE:

In Section **4.4** of RAGS, two types of background are defined, naturally occurring levels and anthropogenic levels. Naturally occurring refers to "ambient concentrations present in the environment that have not been influenced by humans (e.g., aluminum, manganese)." Anthropogenic levels are, "concentrations of chemicals that are present in the environment due to human-made, non-site sources (e.g., industry, automobiles)." Background locations containing concentrations above MCLs could either indicate an upgradient source or a natural source. The text on page 10-72 indicates background concentrations may have added, in part, to the corresponding groundwater concentrations at Site 38. Soil naturally contains these elements at concentrations which sometimes exceed risk-based screening concentrations, as evidenced in Dragun and Chaisson's Elements in North American Soils, 1991. Logically, these elements could be reported in groundwater, and conditions permitting, groundwater background concentrations could naturally exceed MCLs. Using the NAS Pensacola background **data as** a screening tool was agreed upon by the Tier I Partnering Team and **has** been used in RI's and ROD's accepted by both FDEP and USEPA Region IV.

COMMENT:

5. Section 11.0 (Ecological Risk Assessment) indicates potential risk to marine receptors due to groundwater migration and that Florida Surface Water Quality Standards (FSWQS) were exceeded for PCE and TCE in monitoring wells GS32 and GWT03, and for lead in wells GWT03 and GWT18. Our main concern would be in the well most downgradient at the site and nearest the surface water body. These wells would **be** GS32 for Building 604, and wells GS03, GS13, GS02, and GS23 for Building 71. The FSWQS were exceeded for aluminum, iron, and lead in well GS03; for aluminum, cadmium, chromium, iron, and lead in well GS13; for iron and lead in well GS02.

It also indicates that it is difficult to interpret the PCE and TCE FSWQS exceedences in well GS32 as the standard is an annual average. For clarification, the annual average is based on the number of samples taken annually. In the case of a single sample in one year, that is the average. Therefore, the FSWQS is exceeded in well GS32. To determine if the FSWQS is actually being exceeded in Pensacola Bay, you could sample and analyze the sediment pore water or water from a seepage meter taken or placed, respectively, adjacent to the seawall downgradient of these wells.

RESPONSE:

The Navy needs clarification as to what is being requested. The contamination is agreed to exist and text does reflect standards being exceeded.

Responses to Dr. Robert's comments submitted to FDEP

I have reviewed the Final Remedial Investigation Report, Site 38, Naval Air Station Pensacola, Florida, prepared by EnSafe/Allen & Hoshall (E/A&H) and dated August 12, 1996. The manner in which the risk assessment was performed was generally consistent with USEPA guidance and FDEP accepted practices. There are, however, some areas of concern with the analysis, as outlined in my comments below.

COMMENT:

1. E/A&H defines surface soil samples for use in health-based risk calculations as samples from 0 to 1 foot of soil, and uses data below 1 foot in evaluating potential leachability (see pg. 7-5). FDEP typical regards soils from 0 to 2 feet as surficial soils when evaluating potential risks from direct soil contact, and all soils from the surface to the water table when evaluating leachability.

RESPONSE:

In accordance with RAGS, surface soil was defined as zero to one foot. During the December 1994 Partnering meeting, FDEP agreed to hold a meeting with USEPA in February 1995 to discuss their differences in risk assessment assumptions. This meeting was not held. However, the Tier I Partnering Team agreed that soil samples collected from the zero to one foot interval would be used in risk assessments, despite FDEP's defining surface soil as zero to two feet. The Partnering Team also agreed that any remedial actions based on surface soil risk would be.from zero to two feet, rather than zero to one foot, to address FDEP's concerns.

COMMENT:

2. There are apparently some problems with consistency in presentation of the data among various table sand in the text. For example, the maximum concentration of aluminum detected in soils in the Building 71 area is described as 21,200 mg/kg on pg. 7-10, and this is the value listed as the maximum in Table N-1 in Appendix N. Appendix L, however, lists aluminum soil concentrations as high as 24,300 mg/kg. Similar discrepancies are seen for arsenic, beryllium, manganese, iron, and others. There are also problems with consistency in presentation of soils data for Building 604, as well as groundwater data.

RESPONSE:

The Navy agrees to review the data and make the appropriate revisions.

COMMENT:

3. E/A&H correctly cite EPA Region IV guidance as indicating that the arithmetic mean of groundwater concentrations in the most concentrated area of a plume can be used as the EPC. The approach taken by E/A&H is not entirely consistent with this guidance, however. In this report, E/A&H used either the maximum concentration, the UCL, or the arithmetic mean of the detected concentrations. The maximum concentration was used as the EPC only in instances where a contaminant was detected only once or in less than 5% of the total samples analyzed (see pg. 10-17). For the remainder of the chemicals, "... If the UCL was greater than the maximum reported concentration, the arithmetic mean of the detected concentrations was used as EPC. the UCL and arithmetic mean were compared for the remaining chemicals, and the higher concentration was used as EPC." The arithmetic mean of all of the detected concentrations is not the same thing as the arithmetic mean of concentrations within the most concentrated area of the plume. Including marginally contaminated samples in the averaging process has the potential to inappropriately lower the EPC. With respect to the last comparison ("... The UCL and arithmetic mean were compared ...") it is unclear how the UCL could ever be lower than the mean, unless different datasets are used for the calculations. This should be clarified.

RESPONSE:

Please see the response to FDEP's Comment 3. *An* errata page will be provided which more clearly explains the method used to determine exposure point concentrations for groundwater.

COMMENT:

4. The report indicates that when the maximum reported concentration was used as EPC for groundwater, it was "... modified based on the FI to reflect site-wide exposure." Individuals are generally not assumed to have site-wide exposure to groundwater -- consumption of groundwater for domestic purposes will come form a single well. As such, the use of an FI less than 1 (100%) in calculating groundwater contamination intakes is inappropriate. FI and FC values are also used extensively in calculating exposure to soils. Justification for these values is not well explained. On page 10-56, there is some

discussion of an FI/FC based on the percentage of the total exposure area encompassed by the contaminated soil in the case of hot spots. I could find no information regarding procedures for estimating this area, however.

RESPONSE:

It is agreed that consumption of groundwater for domestic purposes would generally be from one well. However, the hypothetical well location is unknown, and groundwater is not a stationary medium. Assuming exposed individuals would select the location having the maximum reported concentration for any given contaminant (thereby creating a theoretical hot spot) would be unreasonable, and RAGS does not recommend using the maximum reported concentrations to estimate exposure, unless the **UCL** is greater than the maximum. In accordance with RAGS, the maximum reported concentration was used only when the **UCL** was greater than the maximum reported concentration. The maximum reported concentration was adjusted for the fraction ingested (FI) to account for the detection frequency and/or spatial distribution of a given chemical, and the adjusted concentration was used as the exposure point concentration. The FI and fraction contacted (FC) were similarly applied for soil exposure point concentrations, only if the maximum reported concentration was used to estimate exposure.

The text on page 10-56 refers to the site-specific tables in Appendices N and O and states that the site-specific text (e.g., specific Building 604 text) will reference the applicable tables. FI/FC is explained in Tables N-3 and 0-3, which are referenced in site-specific text on pages **10-62** and 10-86, respectively.

COMMENT:

In summary, there are a number of important weaknesses in the risk assessment portion of this remedial investigation report that need to be corrected: 1) Discrepancies in data presentation need to be corrected to insure that correct data are being used in the risk calculations; **2)** Development of groundwater EPCs needs to be reevaluated so as to be consistent with USEPA Region IV guidance; **3)** FI/FC values of 1 (100%) should be used for groundwater intake calculations; and **4)** better (clearer) justification needs to be provided for any FI/FC less than 1 for soils.

RESPONSE:

These summary comments were addressed in the specific responses above.