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NAS WHITING FIELD
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LETTER REGARDING U S EPA REGION IV COMMENTS ON SITE 40 DRAFT REMEDIAL INVESTIGATION NAS WHITING FIELD FL
1/5/2004
U S EPA REGION IV

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

January 5, 2004

4WD-FFB

Commanding Officer
ATTN Code ES31 **Linda Martin**
Naval Facilities Engineering Command Southern Division
P.O. Box 190010
North Charleston SC 29419-9010

SUBJECT: NAS Whiting Field, Florida
EPA ID# FL2170023244

Dear Ms. Martin:

The United States Environmental Protection Agency (EPA) has received and reviewed the following document:

- **Remedial Investigation Report for Site 40, Basewide Groundwater, Naval Air Station Whiting Field, Milton, Florida** (Tetra Tech NUS, Inc. April 2003)

Enclosed are the EPA's comments based on this review. Comments are separated into general, for those which apply to the document as a whole, and specific, for those which apply to specific sections of the document. If you should have any questions, please contact me at (404) 562-8555.

Sincerely,

Craig A. Benedikt
Remedial Project Manager
Federal Facilities Branch

Enclosure

cc: James Cason, FDEP
Terry Hansen, Tetra Tech NUS

EPA Review Comments
Remedial Investigation Report, Rev. 0
Site 40, Basewide Groundwater
NAS Whiting Field, Milton, Florida

GENERAL COMMENTS

1. In general a remedial investigation is defined as a nature and extent type of investigation; however, this report provides little information related to the true nature and extent of contamination in the groundwater underlying NAS Whiting Field.

2. Not all of the sites listed in the report are considered installation restoration (IR) sites. A discussion should be included in the report to explain why non-IR sites are being considered in the investigation of basewide groundwater at NAS Whiting Field.

3. A separate section should be added to the report to address the contribution underground storage tank sites (UST) and petroleum related sites (POL) have made to the groundwater contamination at NAS Whiting Field. Only sites previously addressed as IR sites should be the main focus of this report. When UST and POL sites are discussed in the report, appropriate references should be provided for the related reports where additional information can be found.

SPECIFIC COMMENTS

1. **Section 2.3.6.7, Page 2-13:** This section of the report suggests five additional sites were identified during the RI Phase I; however, the report fails to list the sites identified.

2. **Section 3.0, Page 3-1:** In the second sentence of the third paragraph of this section, change "will also be" to "are".

3. **Section 3.4, Page 3-10:** The first paragraph of this section states that natural attenuation parameters were collected; however, no further mention is made of these parameters. Please identify the natural attenuation parameters collected and the rationale for collecting the parameters. This section of the report should also provide a more thorough discussion of the monitoring well installation which took place in support of this investigation (reason for the installation of wells, depth of wells, development of wells, etc.).

4. **Section 5.1, Page 5-2:** In the last sentence of the first paragraph on this page, change "another report" to "any previous reports".

5. **Section 5.2.2.1, Page 5-18, Site 18 Description:** The text states "it is likely contaminated soils were excavated…"; however, no evidence is provided to corroborate this statement. This information should be further investigated so statements such as this can be made in the document. If no proof of this statement can be provided, then the statement should be deleted from the text.

6. **Section 5.2.2.2, Page 5-18:** In the last sentence of the first paragraph, change "and are derived" to ",but have". In the second paragraph, it should be explained how applying TCLP instead of SPLP will affect the development of site-specific limits.

7. **Section 5.4.2.1, Page 5-52:** The text states a soil sample was collected in 2000 and again in 2001; however, no sampling events have been defined.

8. **Section 5.4.2.2, Page 5-60, Site 35 Description:** The fourth sentence of the first paragraph indicated the limits are found in the introduction to the chapter. An appropriated section number should be cited here.

9. **Section 5.4.3.2, Page 5-70, Site 4 Description:** The text states Site 4 is located within Site 1467. Site 4 has not previously been associated with another site at NAS Whiting Field. The Navy should decide if Site 4 is to continue to be investigated as a separate site or as part of another site in the area.

10. **Section 5.6, Page 5-150:** In the second paragraph of this section, the text states that the west bank of Clear Creek is not technically associated with Site 40. This statement is not technically correct. The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) defines a site as the areal extent of contamination and all suitable areas in close proximity to the contamination necessary for implementation of the response action.

11. **Section 5.6.1, Page 5-153, Site 31 Description:** In the fourth sentence of the second bulleted item, change "the NAS Whiting Field Partnering Team" to "it was".

12. **Section 5.7.1, Page 5-174, Site 31:** In the second bulleted item, the text should state that the recommendation for NFA was only for Site 31 soils.

13. **Table 8-2, Page 8-6:** The purpose of a remedial investigation is not to make recommendations for further action. Evaluating the need for remedial action is the purpose of a feasibility study.

The following comments were provided by David N. Jenkins, a hydrogeologist in the EPA, Region 4, Waste Management Division, Technical Services Section:

GENERAL COMMENT:
The report is extensive and describes sample results from a large and varied area. However, most of the report is a simple inventory of the task performed by the consultant and tables of the results from samples collected. The report with the accompanying appendix is a good inventory of the consultant's activities, but it provides little in the way of interpretation of these data. This report would be better titled as a Data Summary Report rather than a Remedial Investigation Report. No areas which require remediation are identified, no specific sources which caused the contamination are identified. The report is simply an accounting of sample results by area within the facility.

The Executive Summary concludes that numerous exceedances of Florida GCTLs in groundwater do not constitute a risk to human health or the ecology because there is no exposure to groundwater within the facility. This statement, coupled the absence of any mention of areas which are likely targets for remediation, seems to imply that no further action should be required at this facility, but this interpretation is not stated in the Executive Summary. Overall, the report contains little in the way of a consultant's interpretation of the conditions at the site in terms of where specific problems are, and what should be done next, and as such, provides relatively little assistance to you as the project manager facing the need for a Feasibility Study.

The PDF file containing the Appendices is more than 9,300 pages long. Nearly 300 wells and boreholes have been installed (Appendix G), yet there is relatively little hydrogeology, relatively little interpretation of the groundwater sample results beyond "screening" comparisons with GCTLs. There are some odd things in the sample results, but there is little in the way of development of a groundwater concept model describing how this site works. Further, this report is titled as the "basewide Groundwater RI", but critical hydrogeologic information is missing from this report. Specifically, the report does not discuss horizontal or vertical hydraulic gradients, groundwater flow velocities, contaminant migration rates, contaminant travel times to potential receptors, contaminant degradation rates,

Information typically presented in a Remedial Investigation for use in a Feasibility Study is missing from this document, though these data may be included in other reports which I have not been given for review. Specifically, areas, depths and volumes of contaminated soil which may require remediation are not presented. Locations, depths and thicknesses of NAPL and DNAPL bodies are not presented. Therefore, there is no way to judge whether an existing groundwater problem will likely be resolved, minimized or made worse by a pending or recommended remedial measure for a source area.

Oddly for a site with many observations of groundwater contamination in excess of the Florida GCTLs, and for which a claim is made that there is no apparent risk to receptors, the report also fails to describe any effort during the Remedial Investigation to quantify any natural attenuation of the contaminants observed. The report makes no statements regarding contaminant migration

rates, or prediction of clean-up times by natural processes. Without an evaluation of Monitored Natural Attenuation (MNA), which follows EPA guidelines, the report includes no information to insure that there will not be an exposure sometime in the future. EPA Guidelines have been available since 1998, and an abundance of relevant literature has been available at least since 1994. The absence of a natural attenuation evaluation in this report is surprising because:

1) the potential for effective natural attenuation is so obvious at this site, and
2) the influence this may have on contaminant transport and fate is favorable,
3) natural attenuation is favorable to the facility's position that there is no risk because there is no exposure to groundwater.

A comparison of Figures 5-3 and 5-4 suggests that both aerobic and anaerobic degradation processes may be working at this site. Further, these figures suggest co-metabolism of TCE in the presence of toluene may be occurring. Natural Attenuation is a "natural" process already working before remedial measures are implemented. Understanding these natural processes can help during the selection of potential remedial measures, or assure regulators and the public that natural protection processes are working, and that the facility has sufficient area to buffer the public from potential effects. But the relevant data are not presented in this report. But this report does not describe the natural processes which effect contaminant migration and fails to describe how this site works prior to the implementation of remedial measures.

BTEX concentrations and TOTAL BTEX graphs:

While natural attenuation processes appear at first glance to be working on some portions of the plume, natural attenuation has not significantly reduced the BTEX concentration in WHF-31-MW-1S over the last 10 years (Appendix E). Total BTEX concentrations rose from 5,030 µg/L in 1994 to 31,540 µg/L in 1995 and 13,280 µg/L in 1998. The most recent data is already 5 years old, the trends indicated are not favorable, the specific location of the source and details regarding the volume of contaminated soil, depth to water, etc., are not included in this report. The three analyses available show both upward and downward trends, but the report fails to include any possible explanation for these observations, or to describe possible seasonal influences on contaminant concentrations, or the possibility that the variations in contaminant concentrations may be the result of slugs of contamination moving through the aquifer.

It should be noted that graphs of Total BTEX (Figure 5.5 and Appendix E) are useful for some interpretation purposes, such as defining the extent of contamination. But because the MCLs for the BTEX compounds vary over 4 orders of magnitude (5-10,000 µg/L), these figures are useless for evaluating whether MCLS or any other standards are being exceeded at these concentrations. Further, the data are presented in a histogram, rather than an XY plot. Note that because these figures are histograms and not an XY plots, the spacing on the X-axis between 1994 and 1998 is equal to the spacing between 1998 and 2000. Extrapolations of contaminant concentration trends over time based on these graphs will be incorrect. The form of presentation used in Figure 5-5 and Appendix E is not the most appropriate presentation for this kind of data.

TCE, DNAPL, expanding plumes and report objectives:

The MCL for TCE is 5 µg/L. The TCE concentrations in WHF-07-MW-1I were above 20,000 µg/L in 3 out of 4 samples collected between 1993 and 2000. At these concentrations, the

presence of TCE as DNAPL should be suspected. The report defines NAPL in the list of acronyms, and states on page 5-1 that defining the extent of NAPL was a purpose of the investigation, but a digital search of the report shows that the term NAPL is not used again in the report after page 5-1. The report has not achieved one of its stated purposes. (See comment regarding Extent of Contamination and Vertical Contaminant Migration)
The TCE concentration in WHF-30-MW-4S increased between 1993 and 2000, and was 100 times greater than the MCL when last sampled 3 years ago. The TCE concentrations in WHF-1466-MW-1S rose from 27 µg/L in 1995 to 954 µg/L in 2000 (Appendix E). No more recent information is provided. Sharp, relatively rapid increases in contaminant concentrations often indicate that a contaminant source remains in the area, or that a slug of highly contaminated material is moving through the aquifer. Clearly, some additional action or investigation may be required in the vicinity of these and similar observations where concentrations are increasing markedly, but these occurrences are not discussed in the report.

EXTENT OF CONTAMINATION AND VERTICAL CONTAMINANT MIGRATION:
Without geologic cross-sections showing vertical hydraulic gradients and contaminant distribution with depth, it isn't possible to determine whether the extent of contamination has been defined. The report states (Section 5.4.3.4) that "*Review of historical data shows the North Central Area plumes have not migrated from the delineated boundaries.*" Figures 5-2A & B show that the aquifer is 50-100 feet thick throughout this facility. TCE is released as a DNAPL, so maybe the plumes have not expanded in map view because the primary direction of movement may be downward!

The text in section 5.4.3.4 states in regard to Figure 5-4: "*The most conservative data primarily from shallow monitoring wells was used to generate the plumes.*" The exact meaning of this statement isn't clear, but the suggestion is most of the data used is from the shallow aquifer, but that unspecified data from other levels of the aquifer also were used in constructing the concentration contours on the map. If this is true, any 3-dimensional aspects of contaminant distribution have been masked. The form of presentation used for the contaminant concentration data is not the most appropriate presentation for this kind of data.

GROUNDWATER FLOW DIRECTIONS AND WATER LEVEL CONTOUR MAPS
The Appendix document (Table G-1) shows that nearly 300 wells have been drilled at the site. Some of the well ID notations are marked to indicate that wells may be screened in the shallow, intermediate or deep part of the aquifer. Water levels are not posted on the water level contour maps, such as Figure 3-9; consequently, the interpretation cannot be independently evaluated. Depths to water and water level elevations are not presented in the Appendix document. Any anomalies, which might be in the water level data, are masked by these presentations. Without showing the data, it isn't clear which well is used to draw the water level contours, such as those on Figure 3-9. The form of presentation used for the water level data is not the most appropriate presentation for this kind of data.

Does a particular water level contour map show data from shallow wells, intermediate wells or deep wells? Hopefully, it isn't a mixture from different levels, but the data used isn't shown, and

the title does not specify which data was used. If similar procedures were used to construct the water level contour maps as were used for Figures 5-4 (see previous comment), any 3-dimensional aspects of groundwater movement have been masked.

Regardless of which conditions are portrayed in Figure 3-9, what are the levels and flow directions in the other parts of the aquifer? What are the vertical hydraulic gradients between them, and how do these gradients effect the movement of groundwater contamination? The report does not address these basic site characterization issues. If contamination distribution does have 3-dimensional aspects, this data will be required for the Feasibility Study and should be included in the RI.

ABNORMAL pH LEVELS:

Table 5-31 shows that only a couple of monitoring wells produce water with "normal" pH levels. Most of the pHs observed are relatively low, but two are greater than 10. The report simply states that the low values are similar to "background wells" without providing an explanation for the low pH observations, and does not comment on the high pH results.

I attempted to look at the water quality in well WHF-32-MW-3D, which is reported to have a pH of 13.21 (Table 5-31), but a digital search of the appendix document failed to show any sample results for this well. Because a pH can't be greater than 14, water from this well is nearly as basic as it can get. Liquids with a pH over 13 are considered hazardous under some circumstances. A pH from a monitoring well which is so greatly different from all others at the site suggests that this well may indicate unusual conditions in the aquifer. Yet this well is not mentioned in the text of the report or in the Appendix document.

SOURCE CHARACTERIZATION DATA IN OTHER REPORTS?:

The report states in numerous places that "*Soil contamination may be a source to groundwater for these analytes.*" Yet the report does not show the location of the contaminated soils, area, thickness or depth below the land surface of the contaminated soils. It does not identify the sources or methods of the contamination, and does not estimate the volume of soil which may require remediation. A remedial investigation is intended to provide sufficient site characterization data to permit potential remedial measures to be selected and for the potential costs of these measures to be calculated. Presumably, this information is already available in the RI reports for other operable units, which I have not reviewed. But this information is not related to the groundwater problems observed in this `report, so there is no way to judge whether a groundwater problem will likely be resolved or minimized or made worse by a pending or recommended remedial measure for a source area.

More importantly in an RI, there is no way to look at the data presented and come to a conclusion that the contamination observed, the direction it is flowing and the relationship to potential receptors all make sense together with the known source locations. There is no way to visually cross-check the data presented.

RECOMMENDATIONS:

1.) Design and implement a groundwater monitoring program which follows EPA guidelines for monitored natural attenuation (MNA) as soon as possible. This should have been done already to provide information for a Feasibility Study. A minimum of one year of quarterly monitoring data is required for an evaluation of MNA. This study should begin as soon as possible to minimize delay in completion of an FS for this facility.

2.) Re-draw and re-evaluate the existing data with a focus on defining 3-dimensional groundwater flow and contaminant migration.

3.) Use the data provided in Step 2 to evaluate the locations of NAPLs and DNAPLS in the aquifer. Identify potential targets for groundwater remediation or containment.