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LETTER REGARDING INTERIM REMEDIAL ACTION WORK PLAN IN SITU RECIRCULATING WELL TREATMENT AT OPERABLE UNIT 4 (OU 4) NTC ORLANDO FL
9/26/1997
U S EPA REGION IV

201.3545

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
100 ALABAMA STREET, S.W.
ATLANTA, GEORGIA 30303-3104
September 26, 1997

4WD-FFB

[redacted]
ID 00434

Mr. Wayne J. Hansel
Southern Division
Naval Facilities Engineering Command
P.O. Box 190010
Charleston, SC 29419-9010

SUBJ: Interim Remedial Action Work Plan Using In Situ Recirculating Well Treatment System, Operable Unit 4, Naval Training Center, Orlando, Florida

Dear Mr. Hansel:

The United States Environmental Protection Agency (EPA) has completed the review of the Interim Remedial Action Work Plan Using In Situ Recirculating Well Treatment System, Operable Unit 4, Naval Training Center, Orlando, dated September 1997.

EPA Region 4 finds the document acceptable. Enclosed are EPA's comments on the subject report.

If you have any questions regarding the enclosed comments, please call me at (404) 562-8536.

Sincerely,

Nancy Rodriguez

Nancy Rodriguez
Remedial Project Manager

cc: John Mitchell, FDEP
John Kaiser, ABB-ES
Lt. Gary Whipple, NTC Orlando
Barbara Nwokike, SouthDiv
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Cc: RODRIGUEZ.NANCY
**Subject: Remediation Work Plan OU4 IRA Comments**
Date: Thursday, September 25, 1997 11:31AM

Hello my friends,

Here are EPA's comments on the work plan. In general, the work plan is technically sound and thorough. Please call me if you have questions.

Thanks, Nancy

## GENERAL COMMENT

1. The contaminant plume of concern appears to originate from a former dry-cleaning facility, and spreads westward for several hundred feet toward Lake Druid. The plume has been defined for the purpose of this interim remedial action (IRA) by a 100 ppb contour line, as approximated by previous site characterization efforts. The objective of the remedial action is to intercept "... the most contaminated portion of groundwater..." (Appendix B, Page 2, Section 1.2). The cleanup target for the recirculating wells is apparently also 100 ppb (Appendix B, Page 7, Paragraph 2 states that total volatile organic compounds (VOCs) will be reduced to 78 ppb). The rationale for the choice of 100 ppb as a definition of the plume and the cleanup target is not given in the document. This concentration is quite high, and neglects groundwater outside of the 100 ppb contour that is also contaminated. The plan also calls for release of treated water from the recirculation zone to continue downgradient at a total VOC concentration approaching 100 ppb. As a point of reference, it is noted that the EPA maximum contaminant levels (MCLs) for trichloroethylene (TCE) and perchloroethylene (PCE) in drinking water are 5 ppb. The MCL for cis-1,2-dichloroethylene (DCE) is 70 ppb. (These three compounds are the principal contributors to the total VOCs in the plume of concern). The rationale for selection of the 100-ppb total VOC cleanup goal should be discussed.

## SPECIFIC COMMENTS

1. Page 14, Section 4.2.4: The text states that ABB-ES, the monitoring program contractor, will collect samples, obtain analyses, and evaluate data from the array of monitoring wells to characterize the "baseline" conditions, and ABB-ES will also conduct subsequent sampling for system performance monitoring (Section4.2.6). SBP, the recirculation well vendor, will conduct its own sampling and analysis of the influent and effluent water from the recirculation wells. According to the Performance Monitoring and Sampling Plan (PS&MP), Appendix A, ABB-ES will use EPA method 8010 to analyze samples from the monitoring wells.

   SBP will use EPA method 8260 to analyze for VOCs in the treatment well influent and effluent waters. The same sampling procedures and analytical methods should be used for both portions of the program so that direct comparisons can be made in the course of performance evaluation. Method 8010 has recently been deleted from the EPA Compiled

Methods; it has been replaced by method 8021. Either method 8021 or method 8260 is recommended by the EPA for analysis of halogenated VOCs. However, the techniques used are different. Both ABB-ES and SBP should adopt the same method. Furthermore, the work plan should state explicitly the methods to be used for sampling. The sampling procedures should cover containers, sample preservation, storage, holding time, chain of custody, etc. Appropriate changes should be made to the text.

2. Appendix B, Page 3: The text states that "... dissolved oxygen (DO) levels in groundwater... can increase" and that "... increased DO concentrations ... enhance biodegradation...". This statement is correct in many cases, but it is misleading in the present context. Chlorinated VOCs are degraded primarily by anaerobic bacteria, and the increased DO due to the recirculation wells will inhibit this process. The presence of significant levels of cis-1,2-dichloroethylene (DCE) in groundwater is strongly suggestive of active, anaerobic degradation under present conditions. DCE is unlikely to be present in the contaminant source, since it is a breakdown product of TCE and PCE. Therefore the breakdown pathways appear to be predominantly anaerobic. The workplan should be modified to reflect the fact that increased DO has a negative impact on the natural biodegradation of the VOCs of concern in groundwater. The performance monitoring program should also include an assessment of the impact of the treatment system on the microbial environment in the aquifer.

3. Appendix B, Page 4, Paragraph 2: The text states, "The ratio of water being recirculated to the water being captured from upgradient is typically 85%". It appears that this statement refers to the ratio of the recirculated volume flux to the total volume flux, rather than to the ratio of the volume flux of recirculated fluid to the volume flux of newly captured fluid, as implied. The statement should be modified for clarity.

4. Appendix B, Page 7, Paragraph 2: Model calculations presented in the text for the proposed configuration predict that, at steady state, 61% of the influent will be recirculated water, while 39% will be newly captured water from upgradient. These figures are significantly different from the values of 85% recirculated and 15% newly captured given as "typical" on Page 4, Paragraph 2. This discrepancy should be clarified.

5. Appendix B, Pages 9-11: Placement of the recirculation wells to meet the objective of capturing groundwater within the 100 ppb total VOC contours, as well as placement of the monitoring wells, relies on model calculations. A critical result of the model calculations is the prediction of the width of the capture zone upgradient from the wells; the result reported in the work plan is 362 feet (Appendix B, Figure 4). This calculation has been subjected to a rough check by means of an approximate, analytical calculation of groundwater withdrawal from a fully penetrating well. For the pumping rate (net capture from the background throughflow), hydraulic conductivity, hydraulic gradient, and saturated thickness given, this idealization yields a capture zone 272 feet. The analytical approximation is similar to the numerical result, given the assumptions implicit in the analytical model; this supports the validity of the numerical results reported in the work plan.

   Predictions of the capture zone, whether derived from the numerical or analytical models, are sensitive to the hydraulic conductivity (and, in the case of the two-dimensional, numerical simulation, to the anisotropy). The source of the values of hydraulic conductivity

(1E-04 meters/second, Appendix B, Page 8) and anisotropy (horizontal conductivity/vertical conductivity =10, Appendix B, Page 8) used should be referenced in the text. An assessment of the uncertainties associated with these values should be given, and the impact of these uncertainties on the model predictions should be discussed. If aquifer tests have not been performed to date in the area of the plume, the work plan should be expanded to include field measurements of hydraulic conductivity. Such tests could be conducted in the planned monitoring wells after the baseline sampling is completed.

6. Appendix B, Page 9, Paragraph 2: Herrling, et al., 1982 is cited in this section, but the reference given (sec. 5.0, p. 18) is incomplete, and may be difficult to trace. If this is a book or technical report, the publisher or appropriate institution should be given. If it is an article within a collection of papers, the complete citation should be given.

7. Appendix B, Page 14, Section 3.4: The calculated mass removal rate to be released to the atmosphere has been checked and is correct. The calculation is highly conservative in this context, as it assumes the highest observed VOC concentration in groundwater and 100% stripping efficiency. The estimate at the highest pumping rate (60 gpm) is still only 20% of the regulatory limit for air emissions.

8. Appendices A and B to Appendix B (unnumbered pages): The naming of sections is awkward, as Appendix B to the report itself has Appendices A and B. References to the latter in the text of the former are confusing. These appendices to the appendix should perhaps be renamed "Sub-Appendix B-1" and "Sub-Appendix B-2" or some other less ambiguous term.

9. Appendices A-E to Appendix C: As noted in Specific Comment 8, nomenclature for sections of the report is confusing. Another system should be adopted for internal consistency.