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LETTER REGARDING U S NAVY RESPONSE TO REGULATOR COMMENTS ON DRAFT  
TREATABILITY STUDY TECHNICAL MEMORANDUM FOR OPERABLE UNIT 4 (OU 4) NTC  
ORLANDO FL  
9/17/1997  
HARDING LAWSON ASSOCIATES



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September 17, 1997

Commanding Officer  
SOUTHNAVFACENGCOM  
Attn: Mr. Doug Dangerfield  
P.O. Box 190010  
2155 Eagle Drive  
N. Charleston, SC 29419-9010

Steve

Subject: Operable Unit 4 (OU 4)

Response to Comments on the Draft Treatability Study Technical Memorandum No. 1,  
Data Collection Plan for Assessing Natural Attenuation  
Naval Training Center (NTC), Orlando, Florida  
Contract: N62467-89-D-0317/CTO 135

Dear Doug:

ABB Environmental Services is pleased to provide a response to comments on the above referenced document. The only comments received were from Cliff Casey which were provided to John Kaiser of ABB-ES on August 26, 1997.

1.) *General Comment: extending the NA investigation into the lake.* The natural attenuation data collection plan currently focuses on the aquifer between the source area and the lake, rather than the lake surface water and sediment. This is necessary because the remedial goal for OU 4 is to achieve surface water standards via natural attenuation within the aquifer before the groundwater discharges to Lake Druid. Historically, Florida has applied surface water standards to groundwater before discharging to the water body. Although the presence of vinyl chloride in the lake provides evidence that natural attenuation is occurring in the sediments, any future need to rely on the lake itself to degrade contaminants will likely be viewed as a violation of surface water standards by the State.

The evaluation of phytoremediation as a remedial technology will also require a quantification of natural attenuation rates in Lake Druid. However, discussions with Steve McCutcheon of EPA's research lab in Athens, GA have EPA focusing on lake related studies, with ABB-ES providing the groundwater characterization. An addendum to the data collection plan could be prepared in the future if the lake is added to the ABB-ES scope. However, this would involve scope, schedule, and budget considerations.

2.) *Specific comment, Executive Summary last paragraph: calculation of target source area concentrations.* One of the goals of modeling will be to determine what source concentration VOCs must be reduced to for natural attenuation to be an effective follow-up remedial alternative. These concentrations will be used as the minimum treatment goals for source remediation. The modeling will be based on half-lives of PCE and its daughter products determined by measuring current concentrations of the contaminants in the groundwater plume. Calculation of target source area concentrations for PCE

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daughter products will not be as straight forward because the concentrations may initially increase during PCE biodegradation before fully decaying. This issue will be addressed by modeling using the newly released beta-version of RT3D. This numerical model accounts for convection, dispersion, diffusion, adsorption, desorption, and microbial processes including sequential degradation involving multiple daughter species. This model will be used in place of the AT123D model proposed in the Draft Data Collection Plan, Section 4.2. This change will be incorporated into the Final Data Collection Plan.

3.) *Specific comment, Page 2-2, use of first order decay - vs. - Monod kinetics.* Biodegradation rates have been typically interpreted through the Monod Equation for enzyme kinetics, which for environmental applications obeys first-order kinetics with respect to substrate and biomass (P. H. Howard and S. Banerjee, 1984, *Interpreting Results from Biodegradability Tests of Chemicals in Water and Soil*). However, the use of a first-order rate constant may not be appropriate if it is determined that more than one substrate is limiting microbial degradation rates. During data evaluation, if it is determined that the site data does not appear to follow first-order kinetics (non-linear) a second- or higher-order approximation may be used to estimate biodegradation rates.

4.) On page 2-3, Chapter 2, the text erroneously stated that hydrogen serves as an electron acceptor instead of an electron donor. The text will be corrected.

Prior to release, the title of this document will be changed from "Treatability Study Technical Memorandum No. 1, Data Collection Plan for Assessing Natural Attenuation" to "Treatability Study Workplan No. 1, Data Collection Data Plan for Assessing Natural Attenuation". If you have any questions or concerns on our response to comments, please do not hesitate to call me at (781) 245-6606 or John Kaiser at (407) 895-8845. We are anticipating releasing the final version of this document near the end of September 1997.

Very truly yours,

ABB ENVIRONMENTAL SERVICES, INC.



Mark J. Salvetti, P.E.  
Task Order Manager

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