



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
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SFD 8-3

September 19, 2001

Glenna Clark
BRAC Operations, Code 06CA.GC/0718
Department of the Navy, Southwest Division
Naval Facilities Engineering Command
1230 Columbia Street, Suite 1100
San Diego, CA 92101

RE: Installation Restoration Sites 4 and 5 DNAPL and Dissolved Source Draft Removal
Action Work Plan for Alameda Point

Dear Ms. Clark:

EPA has reviewed the above referenced draft workplan, prepared by IT Corporation and submitted by the Navy on July 17, 2001. The workplan has been prepared as part of a removal action and as such is considered a secondary document under the Federal Facilities Agreement. EPA is providing comments and expressing concerns about issues within the workplan that may be addressed prior to initiation of the removal action or addressed prior to evaluating the Six Phase Heating technology in the Feasibility Studies for Sites 4 and 5.

EPA would like to stress that heating technologies have proven very effective in lowering concentrations of VOCs in groundwater to concentrations below 100 ppb, and that continuing the pilot study below the stated goals of 10,000 ppb, even if not to 100 ppb, may be very worthwhile.

An issue that may need some careful consideration is that of collecting samples for VOC analysis. Samples to evaluate the effectiveness of the SPH should be collected after the aquifer has had time to cool to normal ambient temperatures. Also, it takes time for desorption to occur, so additional time should be factored in to allow samples to be representative of long-term post-treatment aquifer conditions.

In addition to these two comments, EPA is attaching a number of other comments for your consideration. Thank you for the opportunity to review this document and we look forward to seeing the results of this pilot study.

Sincerely,

A handwritten signature in cursive script that reads "Anna-Marie Cook".

Anna-Marie Cook
Remedial Project Manager

cc: Michael McClelland, BEC SWDiv
Andrew Dick, Lead RPM SWDiv
Mark Berscheid, DTSC
Brad Job, RWQCE
Michael John Torrey, RAB Co-Chair
Karla Brasaemle, TechLaw Inc

**EPA Review of the Draft Project Plans, Installation Restoration Sites 4 and 5
DNAPL and Dissolved Source, Alameda Point**

GENERAL COMMENTS

1. The groundwater flow direction is not shown on any of the figures that show groundwater plumes. In many cases, plume boundaries have been extended beyond sample locations, and it is not clear why this was done. Presumably the extent of the plumes was based on the groundwater flow direction. Please include either water table contour lines or arrows showing groundwater flow directions on all figures. In the closure report, water table elevation contour maps should be presented.
2. Please provide a schedule for the pre-test sampling, treatability tests and full scale implementation.
3. The Quality Assurance Project Plan (QAPP) is a qualitative discussion of the decisions that will be made during the Six Phase Heating (SPH) pilot program, and then essentially a general boilerplate, albeit a complete boilerplate, related to standard procedures of sample handling and laboratory analyses. Please review and revise the QAPP to address data quality issues that apply to the pretreatment, treatment, and post treatment characterization phases of the pilot study and then the scale-up to full-scale implementation. Please list all measurements that will be conducted in each phase, and consider that information beyond measurements of volatile organic compounds (VOCs) is essential both for design of the scale-up and to add confidence that remediation has been successfully implemented.
4. It is unclear whether the SPH program has addressed the condensation of chlorinated hydrocarbon constituents at the head of the thermal front. Please discuss the potential for condensation and formation of a DNAPL mass that then may move to greater depths that is not detected by the planned monitoring network

SPECIFIC COMMENTS

1. **Figure 2 and Field Sampling Plan, Figure 2:** It is not clear why plume 4-3 is not shaded like the other plumes. Please shade this plume or explain why it is not shaded.
2. **Figures 12 through 20:** Please show the estimated extent of groundwater contaminant plumes and the groundwater flow direction(s) on these figures.
3. **Section 3.4, Baseline Groundwater Sampling and Field Sampling Plan, Section 3.1, Full-Scale Design Investigation Sampling:** It is not clear why well MLS-12 is not included for sampling in plume 5-4. Please explain why this well was not included, or include it in the list of wells to be sampled.

4. **Section 3.5, Continuous Soil Coring and Cone Penetrometer Testing:** It is unclear how the soil coring locations will be chosen since the locations of all other Cone Penetrometer Testing (CPT) borings are shown on Figures 12 through 20. Please specify the specific soil coring locations or provide the criteria under which these locations will be chosen.
5. **Section 3.9, Salinity Profiling, Page 3-7:** Salinity profiling is proposed to be conducted in each well to a maximum depth of 50 feet. Salinity profiling is only valid across the screened interval, since any water above the screened interval is both stagnant and a composite of water from other zones. Please describe how the salinity profiling will be done, including the screened intervals of candidate wells. Also, salinity profiling is not mentioned in the Field Sampling Plan and no procedures are provided. Please provide procedures for salinity profiling in the Field Sampling Plan.
6. **Section 4.1.5, Construction of Vacuum Monitoring Piezometers, Pages 4-3 and 4-4:** Since thermocouples will be installed in thermowells that are installed in each vacuum piezometer borehole, please briefly discuss how well epoxy fiberglass and cement grout conduct heat. Also, please explain if the thermocouples will be suspended in air, which is an insulator or if the thermocouples will be in contact with the well casing. Please discuss whether the thermocouples will measure true formation temperature or, if they are suspended in air, some average value.
7. **Section 4.1.6, Groundwater Monitoring Well Construction, Page 4-4:** Please note that the elevated temperature of groundwater samples collected during and immediately after the pilot test will facilitate loss of VOCs. As a result, samples may not be representative of actual conditions in the aquifer. Please revise the text to state that the final round of groundwater samples will not be collected until groundwater has cooled to the ambient temperatures that were observed before the pilot test.
8. **Section 4.1.9, Effluent Treatment and Discharge, Page 4-6 and Section 4.2.10, Effluent Treatment and Discharge, Page 4-17:** It is unclear if the Regional Water Quality Control Board (RWQCB) would approve a discharge permit. Please state whether the RWQCB has been contacted to discuss the potential need for a discharge permit and whether the RWQCB indicated that such a permit would be approved. Also, in the event that a permit is not approved, please discuss other options, including additional treatment of water before discharge to the sanitary sewer.
9. **Section 4.1.9, Effluent Treatment and Discharge, Page 4-7:** If the system is turned off, steam and gas will continue to be produced because temperatures in the subsurface will still be elevated. It is unclear how continued off-gassing will be handled. Please specify how long switching and replacement of the Granular Activated Carbon (GAC) units is estimated to take and also discuss the potential for vapors to migrate and be discharged to the atmosphere while the system is off. Please specify Bay Area Air Quality Management District (BAAQMD) standards for VOCs that would be discharged and specify how the

releases will be monitored and minimized so that the BAAQMD standards are not exceeded.

10. **Section 4.1.11.1, Operations Monitoring and Effluent Sampling, Page 4-10:** It is unclear how the radius of influence of the vapor extraction (VE) system will be determined without installing vacuum monitoring probes beyond the treatment area. Figure 22 does not include any vacuum monitoring probes that would enable confirmation “that the VE system has a radius of influence of approximately 8 ft. outside the treatment area.” Please explain how this determination will be made or include installation of vacuum monitoring probes beyond the treatment zone.
11. **Section 4.1.11.2, Soil and Groundwater Sampling and Analysis, Page 4-11, last paragraph, Section 6.2, Sampling of Wells, Page 6-1, Field Sampling Plan, Section 3.2.1, Groundwater Sampling–Site 4, Page 3-3, Field Sampling Plan, Section 3.3.1, Groundwater Sampling–Site 5, Page 3-6 and Field Sampling Plan, Tables 2 and 3:** VOCs will volatilize more readily from warm groundwater samples and, as a result, analytical results may not be representative of actual concentrations in the aquifer. Please discuss specific procedures to minimize loss of volatiles during sampling. Also, it appears to be unlikely that groundwater would have cooled to normal ambient temperatures 1 to 2 weeks after the heating phase of the study when the final round of groundwater samples will be collected. Please delay the final round of groundwater sampling until after groundwater has cooled to ambient temperature(s) measured before the pilot test. Also, please consider that groundwater sampling at a later time is important to evaluate whether there is still desorption of VOCs from soils, which is important to evaluate the true effectiveness of SPH for treating dissolved VOCs and DNAPLs.
12. **Section 4.3.2, Pilot Treatment Cell Layout, Page 4-13:** According to the text in Section 4-2, this pilot test will also test whether “groundwater extraction to mitigate vertical recharge of groundwater” will “reduce energy consumption and effluent treatment costs.” This objective is not listed in Section 4.2.3.
13. **Section 4.2.9, Hydraulic Barrier Containment System, Pages 4-16 and 4-17:** It is unclear how an excavation to 20 feet that extends 14 or 15 feet below the water table can be held open for long enough to place the slurry mixture without shoring. Please explain how this will be accomplished.
14. **Section 5.9, Full Scale System Operations, Page 5-8:** It is unclear if the intent of the last phrase of the first sentence is to suggest that an additional full-time operator may be needed, since one is already listed in the first part of the section. Please clarify how many full-time operators may be required and whether full-time means 8 hours, 12 hours, or if more time could be required. Also, text and tables in other sections indicate that daily checks will be made. This implies that a person will be present on site each day, and would preclude unattended operation over the weekends. Please resolve this discrepancy.
15. **Tables 14 and 15:** These tables specify the vacuum, temperature, pressure and flow

measurements to be made, list methods to be used, and the minimum frequency of measurements, but do not include the Quality Control (QC) requirements for these measurements. Neither the Field Sampling Plan nor the QAPP include QC requirements for these measurements. Please include QC requirements in these tables or specify the QC requirements in the QAPP.

16. **Appendix B, Section 1.0, Treatment Technology Description: Six Phase Heating, Page 3:** The text in the third full paragraph states “typically, post-remediation characterization of groundwater is performed within one week of the completion of heating. Post remediation characterization of soil is performed about 2 to 3 weeks after completion of the heating period to allow the treatment area to cool...” Post-remediation groundwater sampling should also be conducted only after groundwater has cooled to a normal ambient temperature. This is important because volatilization of VOCs will occur at an increased rate from warm groundwater samples and the resulting analyses will not be representative of contamination in the aquifer. Also, desorption can take several weeks to months. Please change the text to ensure that the post-remediation groundwater sampling will only be done after groundwater has cooled to normal ambient temperatures, and consider either delaying sampling to allow time for desorption or adding an additional sampling round at a later date.
17. **Appendix B, Section 1.0, Treatment Technology Description: Six Phase Heating, Page 5:** Because total organic carbon (TOC) concentrations are not known, samples should be collected and analyzed for TOC. Please include TOC analyses for selected pre-remediation soil and groundwater samples.
18. **Appendix B, Section 1.0, Treatment Technology Description: Six Phase Heating, Page 5, paragraph 2:** Please explain why thermophilic bacteria are considered a factor that will contribute to contaminant degradation and consider pre-remediation characterization of bacteria populations that are present in soil and groundwater before, during and after SPH.
19. **Draft Sampling and Analysis Plan, Section 1.0, Introduction, Page 1-1 and Field Sampling Plan, Section 1.0, Introduction, Page 1-1:** The work plan specifies that soil sampling will be done, but soil sampling is not listed as one of the tasks. Please include soil sampling in the task list.
20. **Field Sampling Plan, Section 3.2.2, Soil Sampling–Site 4, Page 3-4:** The text states in two places that “specific sample depths will be determined in the field by the Project Geologist.” Please discuss the specific criteria that will be used to select the samples (e.g., soil types, presence of groundwater, etc.). Also, please specify the criteria that will be used to select the final evaluation soil samples (e.g., final evaluation soil samples will be collected from the same unit as the pre-treatment samples and from the same depth).
21. **Field Sampling Plan, Section 3.2.1, Groundwater Sampling–Site 4, Page 3-3 and Field Sampling Plan, Section 3.3.1, Groundwater Sampling–Site 5, Page 3-6:** The

method used to retrieve the groundwater samples from direct push locations is not specified. Please specify whether groundwater samples from direct push locations will be collected by bailer or by some other method. Also, please specify whether a submersible or peristaltic pump will be used for low-flow micro-purging.

22. **Field Sampling Plan, Section 4.3.1, Field Duplicates, Page 4-2 and Tables 2 and 3:** The text states that the purpose of duplicate samples is to “evaluate the homogeneity of contaminant distribution in the sampled matrix,” and then goes on to describe collection of blind duplicate samples. Duplicate samples are a measure of sampling technique, laboratory performance, and possible inhomogeneities in the sample. Hydropunch® samples are often more representative of actual groundwater conditions than samples collected from wells with 10 foot well screens because the Hydropunch® sample is collected from a discreet interval (the sampling tool is generally only opened a few inches to a foot). Blind duplicates would be useful for the Hydropunch® samples and should be collected and analyzed. Please add duplicate Hydropunch® samples and revise the text as necessary.
23. **Field Sampling Plan, Section 5.1.3.1, Photoionization and Flame Ionization Detector Operation, page 5-4:** In the previous section, the text states that moisture must be minimized in vapor samples. There is no provision for minimizing moisture when vapor is screened for VOCs and the Work Plan states that GAC will be replaced if any COCs are detected. The presence of moisture can cause apparent readings on the screening instruments. Please clarify whether there will be any provision for minimizing vapor and also define how a COC will be detected using general screening instruments like a photoionization or flame ionization detector.
24. **Quality Assurance Project Plan, Section 3.2, Analytical Data Quality Objectives and Section 3.3, Data Quality Indicators:** The discussion of the various Quality Control (QC) measures appears to apply to quality programs consisting only of water and soil analyses and does not include vapor analyses. There appears to be no discussion of QC measures that apply to the vapor analyses. Similarly, there is no discussion of the QC program that will be applied to the temperature and pressure measurements. Please discuss the QC program that will be instituted for the temperature and pressure data as well as the vapor phase analyses.
25. **Quality Assurance Project Plan, Section 7.0, Data Management:** The QAPP is not specific as to the level of data quality evaluations applied to each parameter. For example, measurements of VOC effluent discharges to sewers or the atmosphere must be of a quality to meet regulatory standards. By comparison, VOC concentrations in extracted fluids may be evaluated by lower standards because the data will be used in less critical applications, such as to quantify mass removal or for evaluation of potential system adjustments. Please discuss the different levels of data quality evaluations as they apply to the objectives of monitoring system performance, measuring mass removal, and demonstrating regulatory compliance.