Department of Toxic Substances Control

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ALAMEDA POINT
SSIC NO. 5090.3

Winston H. Hickox
Secretary for
Environmental
Protection

Gray Davis
Governor

November 7, 2003

Ms. Glenna Clark
Department of Navy
Southwest Division
Naval Facilities Engineering Command
1230 Columbia Street, Suite 1100
San Diego, CA 92101

DRAFT WORKPLAN, IN SITU CHEMICAL OXIDATION PILOT TESTING AT PLUME 4-1, INSTALLATION RESTORATION SITE 4, ALAMEDA POINT, ALAMEDA, CALIFORNIA

Dear Ms. Clark:

The Department of Toxic Substances Control (DTSC) has reviewed the draft workplan for the in-situ chemical oxidation (ISCO) pilot testing at Site 4, dated October 28, 2003. We are concerned that many issues that were raised in our review of ISCO at other sites at Alameda Point are also observed in this workplan. To date the Navy has not responded to DTSC comments and it is unclear if Navy shares DTSC's concerns or is looking into ways to address them.

We recommend that the Navy refer to DTSC comments dated October 8, 2003 for our concerns on the application of ISCO at Alameda Point and incorporate the following in the subject pilot testing:

- Sample the saturated zone soil for contaminants before and after the oxidant injection and make the full data set available to the regulators.
- Institute long-term groundwater monitoring to better comprehend the contaminant rebound (minimum six months of groundwater monitoring is necessary should no saturated zone soil treatment data are available).
- Sample soil and groundwater at multi-depths, i.e. not only the injection point but also above and below the injection point.

- Collect adequate geologic and chemical data specific to Site 4 and properly interpret them to facilitate potential full-scale deployment

- Determine if inhabited buildings are present on, or in proximity to, the treatment area. If so, conduct indoor air screening before and during chemical dosage and continue field monitoring for additional time after the last application of the day;

- Contact the Regional Water Quality Control Board (RWQCB) for possible Underground Injection Control (UIC) requirements.

Please refer to the attached for detailed comments. Should you have any questions, please contact me at (510) 540-3767.

Sincerely,

Marcia Y. Liao

Marcia Liao, Ph.D., CHMM
Project Manager
Office of Military Facilities

Enclosure

cc: Michael McClelland, SWDiv
Greg Lorton, SWDiv
Anna-Marie Cook, EPA
Judy Huang, RWQCB
Elizabeth Johnson, City of Alameda
Peter Russel, Northgate Environmental
Randolph Brandt, LHF
Bert Morgan, RAB Co-Chair
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Department of Toxic Substances Control

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Winston H. Hickox
Agency Secretary
California Environmental
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MEMORANDUM

To: Marcia Liao
Project Manager
Office of Military Facilities
Berkeley Office

Via: John Hart, P.E. for
Chief, Engineering Services Unit

From: Mark Berscheid
Hazardous Substances Engineer
Engineering Services Unit

Date: November 7, 2003

Subject: DRAFT WORK PLAN, IN SITU CHEMICAL OXIDATION PILOT TESTING AT PLUME 4-1, INSTALLATION RESTORATION SITE 4, ALAMEDA POINT, ALAMEDA, CALIFORNIA

This letter addresses conclusions and recommendations related to my review of the Draft Work Plan (WP) for In Situ Chemical Oxidation (ISCO) at Installation Restoration Site 4, Alameda Point, Alameda California. The Report, dated August 28, 2003, has been prepared for the Department of the Navy (DON), Southwest Division, Naval Facilities Engineering Command, Environmental Division, by Shaw Environmental, Inc., Concord, California.

SUMMARY/ RECOMMENDATIONS

The Engineering Services Unit (ESU) considers the ISCO treatment technology to be at the innovative stage of development reflecting limited full scale applications and performance data. The ESU has forwarded for your review US EPA document EPA 542-R-98-008, Field Application of In Situ Remediation Technologies, which has

documented examples of the application of this technology at multiple sites.

Based on the status of the ISCO technology, the ESU concurs with the need to implement a pilot scale test of this technology to assess the ability of ISCO to treat the COCs at this site and obtain the information necessary to implement the technology full scale.

The WP has provided a limited amount of information pertaining to the quantitative data that will be required to fulfill the objectives of the ISCO pilot test defined in Section 4.5 of the WP.

The ESU recommends the use of Table 2-1, Geologic and Chemical Data Needs, and Table 2-3, ISCO Pilot-Test Considerations, in the ITRC guidance document I have forwarded to you titled "Technical and Regulatory Guidance for In Situ Chemical Oxidation of Contaminated Soil and Groundwater".

In addition, to assess the groundwater data required for the evaluation of the ISCO pilot test, the ESU recommends the implementation of multi-depth (i.e., 20 feet bgs, 32 feet bgs, 45 feet bgs), discrete interval monitoring wells as opposed to the singular screened injection/monitoring well construction described in Figure 7 of the WP.

Based on the description of the lithology at this site, it would appear there is a need to assess the ability of the ISCO injection process to provide sufficient oxidant to depths other than the level of maximum contamination concentrations at approximately 35 feet bgs.

With respect to the assessment of effectiveness of ISCO at this site, based on the possible presence of DNAPLs and the results of questionable baseline and post-treatment soil sampling results at other Alameda Point ISCO pilot tests, the ESU recommends long term (i.e., minimum of six months following WP pilot test groundwater sampling event) groundwater monitoring to confirm the results of pilot test activities. Full scale implementation of ISCO should not occur without pilot test positive result confirmation by means of this long term rebounding study.

SPECIFIC COMMENTS

1. As a response to your inquiry of the effects of the injection of the volumes of oxidant injected into the saturated zone, the ESU has made an analysis of the volume injected compared to the site pilot test volume based on the information in the WP and ESU assumptions shown in the following:

a. Volume of injected oxidant per well (1000 gallons) x number of wells (6) x injections (3) = 18000 gallons total oxidant injected

b. Width of pilot test (120 feet) x length of test (210 feet) x depth of test (20 feet) = 504,000 cubic feet

c. Average porosity (.4) x Volume (504,000 cubic feet) = 201,600 cubic feet of GW

d. Groundwater volume (201,600 cubic feet) x gallons/cubic foot (1/.13) = 1,551,000 gallons

e. 18,000 gallons injected/ 1,551,000 gallons GW = 0.011 = 1.1%

As you can see, the total injected volume from three injections is not that significant from the standpoint of dilution effects.

If there are any questions, please contact me at (916) 255-6672.

Department of Toxic Substances Control

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Winston H. Hickox
Agency Secretary
California Environmental
Protection Agency

Gray Davis
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DRAFT MEMORANDUM

TO: Marcia Liao, Ph.D. CHMM
Hazardous Substances Engineer
Office of Military Facilities

FROM: Michael Kenning, RG
Engineering Geologist
Geologic Services Unit

REVIEWED BY: Mark Vest, CEG
Senior Engineering Geologist
Geologic Services Unit

DATE: November 7, 2003

SUBJECT: REVIEW OF IN-SITU CHEMICAL OXIDATION PILOT TESTING AT PLUME 4-1, INSTALLATION RESORATION SITE 4, ALAMEDA POINT, ALAMEDA, CALIFORNIA.

Activity Requested

At your request the Geologic Services Unit (GSU) has reviewed the above document, which is dated August 28, 2003 and was prepared by Shaw Environmental for the U.S. Department of the Navy, Southwest Division, Naval Facilities Engineering Command.

General Comments

The work plan describes the procedures and activities to be performed at the Plume 4-1 pilot test location. The work plan uses field data collected as part of the six-phase heating pilot study to increase the understanding of both the vertical and horizontal distribution of Constituents of Potential Concern (COPCs). It is clear from the data that the vertical and horizontal extent of groundwater contamination has not been determined. Further investigations to determine the extent of soil and groundwater contamination are recommended before full-scale ISCO or other treatments are undertaken. GSU has the following comments on the work plan.

Specific Comments

1. 4.2 Baseline Soil Sampling. This section lists the COPCs and the corresponding U.S. EPA test methods. COPCs include volatile organic compounds (VOCs), total metals, total organic carbon, semivolatile organic compounds (SVOCs), and hexavalent chromium. These COPCs are appropriate. Other constituents are recommended to support the economic and technical feasibility of possible full-scale implementation. These other constituents are reduced iron, manganese, sulfides, and organic acids, which, if present, can have a large influence on the effectiveness of the ISCO treatment due to oxidant consumption. GSU recommends that these constituents be analyzed as well.

2. One soil sample from each of the six injection wells are to be collected within the proposed screen interval of 30 – 35 feet below ground surface (bgs). To better determine the extent of vertical mixing (or channeling) of oxidant, GSU recommends at least one additional soil sample above and below the injection point be collected and analyzed.

3. 6.2.1 Well Installation and Development. GSU recommends that a neat Portland cement mixture (no bentonite) be placed in the annulus above the bentonite layer when the wells are constructed. A properly mixed and placed cement grout seal will be stronger than a water/ cement/ bentonite mixture.

4. GSU recommends the actual ND value next to a sample be included in future cross-sections. For example, the sample taken from 41 to 45 feet bgs in hydropunch 4-1-add 10 should be ND at 250 ug/l.

5. Tables 3 and 4. Because of the high concentrations of TCE, the non-detect (ND) levels in other COPCs are often quite high, generally at 250 ug/l. In such cases the total composite concentration listed is actually the concentration of TCE only, or, if TCE was non-detect, zero. GSU recommends that the symbol "≥" be inserted in front of the value or the ND value in the composite column when the actual total is not known.

6. The preliminary cross-sections in Appendix F appear to be derived from Cone Penetration Test (CPT) data. While the CPT can rapidly obtain continuous (or near continuous) subsurface stratigraphic information, there should be at least one nearby continuously cored and logged borehole to correlate and verify the CPT results. In addition, tip pressure and sidewall friction data should be clearly presented.

7. The trace of cross-section F-F' is missing from Figure 5.

8. The C-C' cross-section shows the intersection of cross-section D-D' at CPT 4-1-add7, even though Figure 5 shows that they are parallel to each other. Please resolve this discrepancy.

If you have any questions, contact me by telephone at (916) 255-3625 or by e-mai1l at mkenning@dtsc.ca.gov.