



Department of Toxic Substances Control



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April 18, 2000

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DRAFT PHASE II FEASIBILITY STUDY, OPERABLE UNIT (OU) 3, INSTALLATION RESTORATION PROGRAM (IRP) SITE 16, CRASH CREW TRAINING PIT NO. 2, MARINE CORPS AIR STATION (MCAS) EL TORO

Dear Mr. Gould:

The Department of Toxic Substances Control (DTSC) reviewed the above report dated February 17, 2000, and received by this office on February 18, 2000. The draft report documents the Phase II Feasibility Study (FS) conducted for IRP Site 16, Crash Crew Training Pit No. 2.

After review of the draft FS, DTSC has the following general and specific comments:

General Comments

1. Presumptive Remedy and Scope of the draft FS: Typically, the feasibility study structure follows the *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA [Comprehensive Environmental Response, Compensation, and Liability Act]*, prepared by the United States Environmental Protection Agency (EPA), dated October 1998. However, this draft FS is structured around the use of a presumptive remedy approach. As such, the draft FS does not include all remedial technology identification and screening steps and it limits its consideration to the no action alternative and the presumptive remedy-based approach.

The presumptive remedy-based process involves an evaluation of applicability to the site, a decision to utilize the process, and a reasonable level of notification to the various parties involved in the remedial process. From the draft FS, it is

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unclear if, when, or how such steps of the process may have been completed. Thus, to enhance the completeness of the draft FS, please include a section that provides justification for identifying and utilizing the presumptive remedies in terms of site specific detail.

2. The draft FS proposes that a pilot study be conducted to evaluate the effectiveness of multi-phase extraction (MPE) at Site 16 prior to the development of the final FS. DTSC concurs with this approach from a technical standpoint because data from a site specific evaluation of MPE would enhance the accuracy and reliability of the remedial evaluation process. Site specific data will provide firmer design parameters, and therefore, a more reliable gauge of effectiveness, implementability, and cost information.

Specific Comments

3. Executive Summary, Results of the RI [Remedial Investigation], Page ES-7, first paragraph after Table ES-1: "Site 16 Unit 3 was recommended for no further action; Units 1 and 2 were recommended for further action to address VOC [volatile organic compound] contamination in deeper subsurface soil (greater than 10 feet bgs [below ground surface]) and groundwater. In addition, the following remedial action objectives were developed for the remedial action"

Please include an explanation regarding the shallow soil (less than 10 feet bgs) for Units 1 and 2. Additionally, it would be useful to provide clarification regarding determination of remedial action objectives. For example, the Remedial Investigation proposes no further action for shallow soil (less than 10 feet bgs) at Units 1 and 2 based on the results of the risk assessment. However, contaminants in deeper subsurface soil (greater than 10 feet bgs) have to potential to adversely impact groundwater quality.

4. Section 1.1.1, Guidance and Agreements, Page 1-5, last paragraph, third sentence: "The BCT [Base Realignment and Closure (BRAC) Cleanup Team] was established to manage and coordinate environmental restoration and compliance programs related to the closure and disposal of MCAS El Toro by July 1999. In addition, the MCAS El Toro BCT has specified in its mission and vision statement that:

- fast-track remediation of sites is necessary to expedite reuse; and
- restoration and reuse are to be maximized by 1999."

It is recommended that the mission and vision statement be revised to reflect the most recent version provided in the 2000 BRAC Business Plan.

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5. Section 1.3.2, Physical Characteristics of the Site, Page 1-24, first partial paragraph: "The shallow aquifer is present beneath Site 16 at a depth of about 165 feet below ground surface (bgs). The regional groundwater flow direction is to the northwest."

Please clarify if the regional groundwater flow direction refers to the direction of flow in the shallow aquifer.

6. Section 1.3.4.2, Surface-Water Transport, Page 1-43, fourth bullet: "the main burn pit, the area of highest soil contamination, is saucer-shaped and is approximately 2 feet below grade at the center (this topography tends to cause ponding of surface water and limits surface runoff) . . ."

Since the topography of the main burn pit tends to pond surface water and limits surface runoff, increased infiltration in this area should be considered in Section 1.3.4.3, Infiltration Transport.

7. Section 1.3.4.4, Chemical Persistence and Mobility, Table 1-5, Estimates of Mobility and Persistence of Selected Organic Compounds at Site 16, Page 1-45: The column for "Half-Life in Soil" is not relevant to Site 16 since the first complete paragraph on Page 1-53 states, "Therefore, it is unlikely that natural attenuation by biodegradation is occurring there [Site 16]."

8. Section 1.3.4.4, Chemical Persistence and Mobility, Volatile Organic Compounds, Page 1-46, fourth paragraph: "As was discussed previously, the results of the soil gas sampling indicates that the highest concentrations of TCE [trichloroethylene] in soil gas at Site 16 are present beneath the main pit and these concentrations increase with depth with the highest the highest concentrations reported at 154 feet bgs. In contrast, the highest concentrations of petroleum hydrocarbons and VOCs (including TCE) in soil are present above a depth of approximately 100 feet bgs.

The difference in detected concentrations may be attributed to the different methods of sample collection for VOC analysis. VOC losses can occur when collecting soil matrix samples, especially at depths greater than 100 feet bgs.

9. Section 1.3.4.4, Chemical Persistence and Mobility, Aquifer Mixing-Zone Calculations, Page 1-49: "To calculate vadose zone mass loading of VOCs to groundwater, a mixing-zone thickness must be assumed from analytical and geologic data."

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Please provide justification and references for applicability of the mixing zone concept, the basis of assumptions, and the representativeness of the calculations.

10. Section 1.3.4.4, Chemical Persistence and Mobility, Aquifer Mixing-Zone Calculations, Page 1-50, first paragraph, fourth sentence: "This model assumes a 1-foot-per-year infiltration, which is a conservative value based on the average regional rainfall of 1 foot per year."

Please provide a reference for the average regional rainfall.

11. Section 1.3.4.4, Chemical Persistence and Mobility, Henry's Law Calculations, Page 1-50, Table 1-7, Mixing-Zone Calculations, Groundwater Volume (per year): The value used for the width of the plume is identified as "200 ft²." Please correct the unit of this value to "200 ft."
12. Section 1.3.4.4, Chemical Persistence and Mobility, Henry's Law Calculations, Page 1-50, Table 1-7, Mixing-Zone Calculations, Recharge Volume: The recharge volume per year should be based on a rainfall rate over a specified area. As a result, the volume is not dependent upon the porosity of the vadose zone and should not be included in this equation.
13. Section 1.3.4.4, Chemical Persistence and Mobility, Henry's Law Calculations, Page 1-50, Table 1-7, Mixing-Zone Calculations, Notes: "^c recharge volume = infiltration rate x area x height x porosity."

The equation specified results in units of feet⁴/year (ft⁴/yr) and is not consistent with the units for recharge volume per year. Height appears to be an extraneous term in this equation. Please clarify.

14. Section 1.3.4.4, Chemical Persistence and Mobility, Henry's Law Calculations, Page 1-50, Table 1-7, Mixing-Zone Calculations, Recharge Volume: It appears that the infiltration area is represented by the values, "200 ft² x 200 ft." Please correct the unit for the first value. Additionally, please provide clarification for dimensions used for the infiltration area. In general, infiltration in this area is also dependent upon the drainage in the area and should consider the drainage patterns and surface water hydrology, including watershed area, vegetation, and topography.
15. Section 1.3.4.4, Chemical Persistence and Mobility, Henry's Law Calculations, Page 1-50, Table 1-7, Mixing-Zone Calculations, Notes: "^a groundwater flow

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equation; average linear velocity = (hydraulic head x hydraulic conductivity)/porosity."

Please clarify that the equation for average linear velocity uses "hydraulic gradient" rather than "hydraulic head."

16. Section 1.3.4.4, Chemical Persistence and Mobility, Henry's Law Calculations, Page 1-51, first complete paragraph, fourth sentence: "The concentration threshold for soil gas is calculated by multiplying the U.S. EPA MCL [maximum contaminant level] (by VOC [volatile organic compound] species) by a rounded mixing-zone ratio (15) and the Henry's constant."

See Comment Number 9.

17. Page 1-52, Table 1-8, Vadose Zone Soil Gas Concentration Threshold Calculations, Concentration Threshold Calculations.

See Comment Number 9.

18. Section 1.3.4.5, Numerical Modelling, Vadose Zone Modeling, Page 1-54, fourth paragraph, last sentence: "Each cell was then assigned an initial TCE concentration (Table 1-9)."

Please provide clarification for how the initial TCE concentration was estimated.

19. Page 1-57, Figure 1-13, Predicted Soil Gas Concentrations From VLEACH [Vadose Zone Leaching model]: The values shown for the initial time that are identified as soil gas concentrations in micrograms per liter ($\mu\text{g}/\text{L}$) appear to be the same values listed in Table 1-9, Initial Soil Concentration Profiles for VLEACH identified for soil matrix concentrations in micrograms per kilogram ($\mu\text{g}/\text{kg}$).

Please provide clarification regarding the determination of soil gas concentrations ($\mu\text{g}/\text{L}$) from detected soil matrix concentrations ($\mu\text{g}/\text{kg}$).

20. Section 3.3, MPE System Conceptual Design, Page 3-15, first complete paragraph: "It has been estimated that SVE [soil vapor extraction] from the MPE well will operate at a vapor flow rate of 50 cfm [cubic feet per minute] with a vacuum of 100 to 150 inches of water The total system flow is assumed to be 150 cfm, at approximately 100 to 150 inches of water."

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Additionally, in Subsection 3.5.2, Alternative 2 - Multiphase Extraction With Vapor-Phase Granular Activated Carbon Treatment of Extracted Vapors, page 3-18, first complete paragraph: "It has been estimated that the MPE well will operate at a vapor flow rate of 100 cfm with a vacuum of 100 to 150 inches of water"

Please clarify the discrepancies in vapor flow rate that varies from 50 to 150 cfm in Section 3.3 and is listed as 100 cfm in Section 3.5.2 and revise the cost estimates, as needed.

21. Section 4, Detailed Analysis of Alternatives: It is recommended that a summary of the preliminary design basis for the cost estimates be included in this section. The preliminary design information can be presented in a table and should include basic design parameters.
22. Section 4, Cost Estimate Summary Tables 4-1 through 4-3, 4-6 through 4-8: The cost estimate tables for Alternatives 2a through 2c show operation and maintenance (O&M) cost line items for the vapor phase carbon adsorption for years two and three. In addition, the cost estimate table for Alternative 3a through 3c show O&M cost line items for thermal and catalytic oxidation for years two and three. However, on Page 3-18, "It is projected that the vapor portion of the MPE would need to be conducted for approximately 6 months in order to reach the goal of reducing the soil TCE concentrations"

Please provide clarification for the inconsistency between the tables and the text on Page 3-18, and revise the cost estimates, as needed.

23. Appendix B, Cost Estimate Summary Tables B4-1 through B4-3 and B4-6 through B4-8:

See Comment Number 22.

24. Section 4.2.5, Alternative 2d, page 4-27 and Section 4.2.6, Alternative 2e: The TCE-containing air exiting the air stripper would be essentially saturated with water vapor (i.e. be at 100 percent relative humidity). Channeling a water-laden air stream directly into the vapor-phase activated carbon canisters would drastically reduce the adsorptive capacity of the activated carbon for TCE and other VOCs. To prevent this condition from occurring, a heat source would normally be installed between the air stripper and the vapor-phase activated carbon vessels. The source would heat the air stream to approximately 90 to 120 degrees Fahrenheit to effectively reduce the relative humidity of the air to

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less than 50 percent which is the normal humidity range for vapor-phase activated carbon operation.

It is recommended that this scenario be further developed and the appropriate cost estimates be revised accordingly.

25. Section 4.2.2, Alternative 2a, page 4-8; Section 4.2.3, Alternative 2b, page 4-13; and Section 4.2.4, Alternative 2c, page 4-20: Additionally, high humidity may also require consideration for Alternatives 2a through 2c. In these Alternatives, the extracted soil vapor stream from the MPE well would be treated by vapor-phase activated carbon.

Again, if the humidity is greater than approximately 50 percent, appropriate corrective measures may be necessary. See Comment Number 24.

26. Section 4.2.4.7, Table 4-3, page 4-28 and Section 4.2.9.7, Table 4-8, page 4-62: The estimated costs shown for "General Monitoring - GW" for Alternatives 2c and 3c are substantially lower than those shown for other alternatives.

Please provide clarification. This clarification can be included in the footnotes of the table.

27. Section 4, Cost Estimate Summary Tables 4-1 through 4-8 and Appendix B, Cost Estimate Summary Tables B4-1 through B4-8: The line items for monitoring under O&M should be consistent in all of the Cost Estimate Summary tables for all of the alternatives which should also be consistent with the narrative descriptions for monitoring provided in Appendix B.

Please provide clarification or revisions as requested in the above comments. If you have any questions, please contact me at (714) 484-5395.

Sincerely,



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