

RECEIVED  
CODE 18



October 11, 1996

16 Oct 96 18 45



Cal/EPA

Department of  
Toxic Substances  
Control

245 West Broadway,  
Suite 425  
Long Beach, CA  
90802-4444

Mr. Joseph Joyce  
BRAC Environmental Coordinator  
U.S. Marine Corps Air Station - El Toro  
P. O. Box 95001  
Santa Ana, California 92709-5001

Pete Wilson  
Governor

James M. Strock  
Secretary for  
Environmental  
Protection

**DRAFT FINAL REPORT APPROVAL: INTERIM REMEDIAL INVESTIGATION/  
FEASIBILITY STUDY (RI/FS) FOR SITE 18, OPERABLE UNIT 1 (OU-1), MARINE  
CORPS AIR STATION (MCAS) EL TORO**

Dear Mr. Joyce:

The California Environmental Protection Agency (Cal/EPA) has completed the review of the above subject documents dated August 9, 1996, prepared by CH2M HILL, Inc. The document consists of the RI report, the Human Health Risk Assessment, the Interim Action Feasibility Study (IAFS), the RI Report Addendum, and the IAFS Addendum. The reports present the results of the regional (offsite) groundwater contamination and the feasibility study conducted to identify and evaluate potential remedial action alternatives for volatile organic compounds (VOC)-contaminated groundwater at Site 18.

The documents are generally acceptable provided that the enclosed Department of Toxic Substances Control and Regional Water Quality Control Board specific comments dated October 8, 1996 are incorporated into the final RI/FS documents. The general comments should be incorporated into future OU-1 documents. The following major comments should be incorporated into the OU-1 draft final Proposed Plan and Record of Decision (ROD):

1. A review of the IAFS (October 15, 1995), the IAFS Addendum, and available historical groundwater data have shown that there are groundwater data gaps, especially at the western boundary of the contaminant plume.
2. If an alternative is chosen which includes a joint Navy/Orange County Water District (OCWD) project, a long-term groundwater monitoring plan must be approved by the regulatory agencies before submittal of the draft ROD. Such an alternative would be based on a timely agreement between the Navy and OCWD, the Navy is required to comply with deadlines established under the Federal Facilities Agreement.



Mr. Joseph Joyce  
October 11, 1996  
Page 2

3. If an alternative is chosen which includes a Navy stand alone alternative for the principal aquifer, a long-term monitoring plan, including additional monitoring wells installed at the toe of the plume, with aquifer tests performed and the data evaluated with regard to capture zone analysis must be submitted to the regulatory agencies for approval prior to submittal of the draft ROD.

If you have any questions regarding the comments, please call Mr. Tayseer Mahmoud at (310) 590-4891.

Sincerely,



John E. Scandura, Chief  
Office of Military Facilities  
Southern California Operations

Enclosures

cc: Ms. Bonnie Arthur  
U. S. Environmental Protection Agency  
Region IX  
Hazardous Waste Management Division, H-9-2  
75 Hawthorne Street  
San Francisco, California 94105-3901

Mr. Lawrence Vitale  
Remedial Project Manager  
California Regional Water Quality Control Board  
Santa Ana Region  
3737 Main Street, Suite 500  
Riverside, California 92501-3339

Mr. John Dolegowski  
CH2M HILL  
3 Hutton Center Drive, Suite 200  
Santa Ana, California 92707

Mr. Roy Herndon  
Orange County Water District  
10500 Ellis Avenue  
P.O. Box 8300  
Fountain Valley, California 92728-8300

*Mr. Joseph Joyce*  
*October 11, 1996*  
*Page 3*

cc: Mr. Andy Piszkin  
Remedial Project Manager  
Naval Facilities Engineering Command  
Southwest Division, Code 1831.AP  
1220 Pacific Highway  
San Diego, California 92132-5187

**DEPARTMENT OF TOXIC SUBSTANCES CONTROL**  
**Comments on**  
**Draft Final Remedial Investigation Feasibility Study Report For Site 18, OU-1**  
**Marine Corps Air Station El Toro**  
**Dated August 9, 1996**

The lists of comments below were prepared by Mr. Tayseer Mahmoud, Remedial Project Manager, and Ms. Sherrill Beard, Engineering Geologist from the Department of Toxic Substances Control. The comments are directed to MCAS El Toro and their consultants. Some of our comments reflect Orange County Water District comments and the Geoscience IAFS review. Please incorporate the specific comments into the final RI/FS documents. The general comments should be incorporated into future OU-1 documents.

**General Comments:**

1. A review of the IAFS (October 15, 1995), the IAFS Addendum, and available historical groundwater data have shown that there are groundwater data gaps, especially at the western boundary of the contaminant plume. If an alternative is chosen which includes a joint Navy/OCWD project, a long-term groundwater monitoring plan must be approved by the regulatory agencies before submittal of the draft Record of Decision (ROD).

If an alternative is chosen which includes a Navy stand alone alternative for the principal aquifer, a long-term monitoring plan, including additional monitoring wells installed at the toe of the plume, with aquifer tests performed and the data evaluated with regard to capture zone analysis must be submitted to the regulatory agencies for approval prior to submittal of the draft ROD.

2. Based on the previous review of the IAFS (dated December 13, 1995) and the subject documents it should be restated that one of the remediation goals for the contamination detected in the shallow aquifer should be containment. Specifically, to prevent further migration downward into the principal aquifer.
3. The groundwater model presented in Volume VI or an expanded version of the groundwater and solute transport models used for OU-2A (Site 24, VOC Source Area) should be refined during the design phase. We suggest that the nodal spacing for the groundwater model reflect a finer grid and the assigned hydrogeologic parameters, such as hydraulic conductivity and retardation, more accurately reflect the actual groundwater regime.

**Specific Comments:**

**1. Volume 1, Executive Summary, Section 4.3.1 Evaluation of Alternatives in the IAFS Addendum, Contingency Plan, page ES-49**

Refer the reader of this Executive Summary where to turn to for additional information regarding the contingency plan.

**2. Volume 1, Executive Summary, Section 4.3.2 Evaluation of Alternatives in the IAFS Addendum**

Reference to Table ES-5 is a typographical error. The correct reference is ES-6.

**3. Volume II, Draft Final Remedial Investigation, Attachment 1, Response To Comments**

Please provide the date of comments in your responses. Also, provide copies of the agencies comments for the public to see the actual comments. This comment also applies to Volume IV, Attachment A.

**4. Volume IV, Draft Final IAFS Report, Section 2.0 RAOs and ARARs, Table 2-2**

Some chemicals in this table did not have risk base concentrations (RBCs). The following information on three chemicals might be useful:

- a. **Dichlorodifluoromethane:** This compound is also known as Freon 12. As of August 1996, USEPA Region IX gives residential Preliminary Remediation Goals (PRG) of 94 mg/kg in soil and 390 µg/L in water. These are based on an oral reference dose (RfD<sub>o</sub>) of 0.2 mg/kg-day and an inhalation reference dose (RfD<sub>i</sub>) of 0.057 mg/kg-day.
- b. **2-Butanone:** This compound is also known as methyl ethyl ketone. As of August 1996, USEPA Region IX gives residential PRGs of 7,100 mg/kg in soil and 1,900 µg/L in water. These are based on an RfD<sub>o</sub> of 0.6 mg/kg-day and an RfD<sub>i</sub> of 0.6 mg/kg-day.
- c. **2-Hexanone:** This compound is also known as methyl-n-butyl ketone. No PRGs or reference doses are published for this chemical. However, *n*-hexane is metabolized in mammals first to 2-hexanone then to the neurotoxic 2, 5-hexanedi-one. Therefore, *n*-hexane is an adequate surrogate compound. As of August 1996, USEPA Region

IX gives residential PRGs for *n*-hexane of 110 mg/kg in soil and 350 µg/L in water. The PRG in soil is the saturating concentration, while the PRG for tap water is based on an RfD<sub>0</sub> of 0.06 mg/kg-day and an RfD<sub>1</sub> of 0.057 mg/kg-day.

**5. Volume VII, Draft Final IAFS Report, Appendix B, Evaluation of ARARS, Table B2-3**

See comment #3 above regarding RBCs.

**6. Volume IX, Draft Final IAFS Addendum, Section 1.3.1 Site History**

Reference to off-Station TCE highest concentration of 34 µg/L is not accurate. OCWD data reflects higher numbers up to 47.8 µg/L. Please make the corrections throughout the document.

**7. Volume IX, Draft Final IAFS Addendum, Section 1.3.3, Nature and Extent of VOC Contamination**

Table 1-3 is referenced on page 1-11 but not provided in the document.

**8. Volume IX, Draft Final IAFS Addendum, Section 2.0, Summary of Remedial Alternatives Evaluation**

Reference to IAFS in this section should be changed to draft IAFS.

**9. Volume IX, Draft Final IAFS Addendum, Section 3.2, Applicable or Relevant and Appropriate Requirements, page 3-2**

The last paragraph regarding additional ARARs for the new alternatives should be revised. On September 17, 1996, MCAS El Toro requested the State to provide any additional ARARs. Please note that the State provided ARARs for Site 24 which has similar alternatives as Site 18.

**10. Volume IX, Draft Final IAFS Addendum, Section 5.2.1, Alternative 7A, page 5-2**

Alternative 7A assumes that wells 18\_TIC113 and 8\_IRWD78 will continue to be operational throughout the duration of the required monitoring period, therefore, cost for the implementation does not include the extra expenditure if these wells need to be replaced, recondition, and/or purchased.

11. **Volume IX, Draft Final IAFS Addendum, Section 5.2.2, Alternative 7B, page 5-3**

The Navy should shorten the screen length for the proposed new monitoring wells and increase monitoring locations and depths by either constructing multiple port monitoring wells or install more than the proposed number of conventionally constructed monitoring wells.

12. **Volume IX, Draft Final IAFS Addendum, Section 5.3.2.1, One Half the MCL, page 5-7**

The term "relevant MCL" should be further defined with regard to state and federal MCL regulatory concentrations.

13. **Volume IX, Draft Final IAFS Addendum, Section 6, Figures 6-1, 6-3, 6-5, 6-7, 6-9, etc.,**

Figures showing the placement of the shallow groundwater extraction wells; Shallow groundwater extraction well placement should be close enough to the source to both maximize mass contaminant removal and maintain hydraulic containment. Please consider this recommendation while evaluating the design of the shallow groundwater extraction well network.

14. **Volume IX, Draft Final IAFS Addendum, page 6-8, Figures 6-8, 6-14, 6-20, 6-26, 6-32, and 6-38**

The pumpage rates and pumping schedules (Table 6-2) are similar for both irrigation wells 18\_TIC113 and 18\_IRWD078 yet the figures illustrating particle tracking indicated most simulated path lines migrating toward 18\_IRWD078 and 18\_NLAKE. This is most likely due to the prevailing hydraulic gradient, however, it may be helpful to overlay the simulated groundwater elevations over the particle tracking figures illustrating the effect or non-effects of pumpage from specific wells (i.e., 18\_TIC113).

15. **Volume IX, Draft Final IAFS Addendum, Section 6.9, Cleanup Time to TCE MCL Simulation, page 6-29, 3rd paragraph**

According to Table 6-9, the simulated cleanup time to TCE MCL in the Principal Aquifer for Alternatives 2A, 7A, and 7B, ranges from 43 to 60 years. Also, for Alternatives 6A, and 8 are 49 and 70 years, respectively. Please correct the 3rd paragraph.

**16. Volume IX, Draft Final IAFS Addendum, Section 7.2.4.2, Compliance with ARARs - Alternative 7A**

This section needs to discuss compliance with ARARs for the principal aquifer or refer to the discussion if provided in another section of the report. This comment also applies to Section 7.2.5.2, Alternative 7B, and Section 7.2.6.2, Alternative 8.

**17. Volume IX, Draft Final IAFS Addendum, Attachment E, Cost Estimates**

Cost estimates for all alternatives which include injection into both the shallow aquifer and/or the deep principal aquifer should include operational costs that will be needed to maintain a successful injection well, such as maintenance to control mineral scaling in the injections wells and the air stripping treatment unit.

**18. Volume IX, Draft Final IAFS Addendum, Attachment G, Groundwater Monitoring, page G-1**

Please include the reference to the Groundwater Monitoring Plan (28 April 1995) in the Reference section of Volume IX.

**19. Volume IX, Draft Final IAFS Addendum, Attachment G, Groundwater Monitoring, page G-2, bullet 2**

Based on the available information to date, air sparging should not be considered as a remedial technology.

**20. Volume IX, Draft Final IAFS Addendum, Attachment G, Groundwater Monitoring, Table G-1**

The CFEST groundwater model has served well as a comparative tool for the evaluation of the different alternatives presented in the FS, however, future groundwater modeling for the purposes outlined in Table G-1 should not be limited only to the CFEST model.

**21. Volume IX, Draft Final IAFS Addendum, Attachment G, Groundwater Monitoring, Section G.2 and G.2.1, page G-3**

The additional monitoring wells proposed as part of the long term monitoring network throughout the IAFS Addendum should be installed before the reconnaissance phase. One of the primary objectives stated as part of the reconnaissance phase is to identify data gaps need to be addressed to assess whether the proposed monitoring well network meets groundwater

monitoring objectives. The IAFS and the IAFS Addendum have already shown that data gaps exist. Therefore, the proposed additional monitoring wells should be installed and included as part of the reconnaissance phase. If, after the reconnaissance phase, the groundwater data shows further data gaps, then additional wells should be installed if determined necessary by the BCT.

**22. Volume IX, Draft Final IAFS Addendum, Attachment G, Groundwater Monitoring, Section G.2.1, Reconnaissance Phase, page G-4**

Groundwater from all newly constructed monitoring wells should be analyzed not only for the proposed VOCs and TDS, but also for general chemistry during the reconnaissance phase and then evaluated and reduced to VOCs and TDS, if appropriate. The new monitoring wells will be installed at locations that are considered "data gaps" therefore it is necessary to collect and analyze the requested data to adequately evaluate the water-quality of the aquifer at the additional monitoring well locations.

Other field measurements to be collected besides electrical conductivity (EC), pH, and temperature, are dissolved oxygen (DO) concentration, turbidity, and oxidation-reduction potential (Eh). These additional aquifer geochemical parameters are necessary to evaluate the water-quality, integrity of the groundwater sample, and to evaluate the contribution of biodegradation to the attenuation of the contaminant plume. While DTSC understands that at present biodegradation of the contaminate plume may be a minor portion of the attenuation of the plume, monitoring DO, Eh and general chemistry will provide data to gage future biodegradation rates.

**23. Volume IX, Draft Final IAFS Addendum, Attachment G, Groundwater Monitoring, Section G.2.2, Compliance Phase, page G-5**

Groundwater elevation measurements should be collected a minimum of twice a year throughout the duration of the compliance phase to monitor summer/winter groundwater fluctuations.

**24. Volume IX, Draft Final IAFS Addendum, Attachment G, Groundwater Monitoring, Table G-3**

This table and the September 30, 1994 Groundwater Quality Data Report describes the well screen interval for 18\_MCAS08 as 205-410 feet below ground surface (a 205-foot screened interval) and the July 21, 1994 RI/FS Draft Groundwater Monitoring Program Plan reports the screened interval as 392-410 feet below ground surface (a 18-foot screened interval). Please reconcile this inconsistency and cross-check for any additional errors.

**25. Volume IX, Draft Final IAFS Addendum, Attachment G, Groundwater Monitoring, Figures G-2, G-3, and G-4**

Given the present flow gradient of the subbasin, results of the simulated flow gradients, and the simulated contaminate pathlines (shown on figures in Section 6), the location of new proposed monitoring well 18\_ADD7 should be reconsidered and moved further south.

# Memorandum

To: Mr. Tayseer Mahmoud  
Department of Toxic Substances Control  
245 West Broadway, Suite 350  
Long Beach, CA 90802-4444

Date: October 8, 1996

From: CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD - SANTA ANA REGION  
3737 MAIN STREET, SUITE 500, RIVERSIDE, CALIFORNIA 92501-3339  
Telephone: CALNET 632-4130 Public (909) 782-4130

Subject: DRAFT FINAL OPERABLE UNIT 1 INTERIM - ACTION FEASIBILITY STUDY REPORT  
(IAFS)

We have reviewed the subject report dated August 9, 1996 and received by us on August 12, 1996. In addition, we have reviewed comments from the Orange County Water District (OCWD) report Review of Ground Water Modeling Report and Potential Impacts of TCE Contamination (Geoscience Support Services Inc.). We have the following comments, some of which, reflect the OCWD comments and the Geoscience IAFS review.

## GENERAL COMMENT

The IAFS report identifies the feasible alternatives that will mitigate the regional groundwater plume emanating from Marine Corps Air Station (MCAS) El Toro. The next phase of the remedial project is to select the preferred alternative from those listed in the IAFS. The preferred alternative will be based on protection of human health and the environment, cost, implementability, community and regulatory acceptance. The IAFS report is acceptable to the extent that it identifies feasible remedial alternatives to mitigate the regional groundwater plume. If the model is the basis for selecting the final remedy, then additional groundwater data must be collected and the model must be refined prior to design and implementation.

## Specific Comments:

1.0 Statements are made in the Executive Summary and other sections of the report that 34 µg/L is the highest Trichloroethylene (TCE) concentration detected in the principal aquifer. However, TCE in the principal aquifer has been detected at levels near 50 µg/L in well MCAS - 7 on 12/22/95, and above 34 µg/L in various other wells.

2.0 On page 5-6, Volume IX, the last line of the last sentence states, "consideration of actions, if any, needed to protect actual beneficial uses." Please modify to state, "..... to protect beneficial uses as stated in the Water Quality Control Plan, Santa Ana River Basin."

3.0 Vol. IX, 7.2.2.2, Compliance With ARARs

The last paragraph refers to SWRCB Resolution No. 68-16. The report states that Resolution No. 68-16 does not apply to the El Toro regional groundwater plume because the plume is not a new discharge.

Resolution No. 68-16 is intended to protect /maintain high quality waters. We agree that the El Toro regional groundwater plume is not a new discharge, as long as it does not migrate. However, if contaminant migration is occurring (above maximum contaminant levels) then higher quality waters will be negatively impacted by the discharge of contaminants from the plume which violates Resolution No. 68-16.

#### General Comment on the Groundwater Model

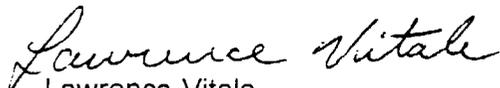
The groundwater modeling activities associated with the IAFS report compare feasible alternatives to remediate or control the regional groundwater plume emanating from MCAS El Toro. Specific parameters used in the model may be debatable, such as the constant head boundary at the downgradient edge of the plume, retardation factors, hydraulic conductivities, sensitivity analysis and calibration. Since modeling is not an exact science, continued refinement is necessary to improve and enhance the accuracy of the model predictions. If the model is used as the basis for selecting the remedial alternative, then model refinement will be required in order to increase confidence in the selected alternative and predicting plume behavior.

#### Specific Comments on the Groundwater Model

- 1.0 We do not agree with the northwestern constant head boundary condition represented in the model. Water level variations up to 60 feet have occurred in wells near the presumed plume boundary (OCWD well data). These variations may affect the flow velocity which may in turn affect the plume migration estimate. Transient boundary head conditions should be represented in the model to provide a more realistic estimate of aquifer/plume behavior.
- 2.0 The retardation factor may be too high. The remedial investigation report indicates that total organic carbon is less than 0.04 percent of the total mass of the soil and provides little opportunity for adsorption to take place. Please explain how the retardation factor was calculated, taking into account the low organic carbon content in the soil.
- 3.0 Model calibration was attempted using two rounds of groundwater monitoring samples. The monitoring samples were collected between 1992 and 1993 ("they were all we had," CH2MHill, IFS modeling meeting, 9/26/96). It would be advantageous to include OCWD data, from past years, and the recent CDM data. The reported model calibration for potentiometric groundwater elevation exhibited a wide range of predicted to actual groundwater elevations (0 to 30 feet difference). The wide range of predicted to actual groundwater elevations is not an accurate calibration. Additional data collection should improve the model performance and will be required prior to final remedial design and implementation.
- 4.0 Hydraulic conductivities may be too low (13 to 35 feet/day). OCWD data indicate hydraulic conductivities up to 67 feet/day (preferential pathways probably exist in the regional plume). The sensitivity analysis in the report should account for the higher observed hydraulic conductivities.

5.0 Alternative 2B was used for the model solute transport sensitivity analysis. It would be appropriate to apply this analysis to the new alternatives 7A and 7B, the natural attenuation alternatives. If a natural attenuation alternative is selected, a solute transport analysis would be useful in supporting the selection.

If you have any questions, please call me at (909) 782-4998.

  
Lawrence Vitale  
DoD Section

cc: Mr. Roy Herndon, Orange County Water District, P.O. Box 8300, Fountain Valley, CA  
92728