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MCAS EL TORO
SSIC # 5090.3

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

SEP 14 PM 3:25

September 6, 1994

Mr. Wayne Lee, Assistant Chief of Staff
Environment and Safety
MCAS El Toro
P.O. Box 95001
Santa Ana, CA 92709

Dear Mr. Lee:

EPA has reviewed the "Draft Operable Unit 1, Remedial Investigation Report," prepared for Marine Corps Air Station, El Toro, California, dated July 1, 1994. Please address the enclosed comments (Enclosures A and B). Comments from EPA's technical support staff are included as Enclosure B. If you have any questions, I can be reached at (415) 744-2389.

Sincerely,

Bonnie Arthur
Remedial Project Manager
Federal Facilities Branch

Enclosures

cc: Mr. Juan Jimenez, DTSC
Mr. John Broderick, RWQCB
Mr. Joseph Joyce, SW DIV
Mr. Andy Piszkin, SW DIV
Mr. Dante Tedaldi, Bechtel

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ENCLOSURE A

EPA COMMENTS ON MCAS EL TORO
DRAFT OU 1 REMEDIAL INVESTIGATION (RI) REPORT

GENERAL

1) The OU 1 RI is not acceptable as a full RI, therefore, the title on the document and any reference to the title within the report, must be changed to Interim OU 1 Remedial Investigation Report.

2) References to other documents, for example the "TM", should be kept to a minimum. Data should be included in an appendix if it is required to present comparisons/rationale.

3) It is premature to conclude that the presence of high gross alpha and gross beta is due solely to natural sources.

SPECIFIC

1) Page 3-24; Identify the hydrogeologic units clearly and provide ranges of hydrogeologic properties for each unit.

2) Page 3-71; Provide pumping rates of the production wells which contribute to the "overall downward vertical gradient..."

3) Page 3-106; Discuss the relevance of the extensive major ion water quality analyses.

4) Page 4-1; Clarify why it can be stated that phthalates are not due to "environmental contamination contributed by the Station."

5) Page 4-1; Provide rationale for statement that "no inorganics [were] contributed by the Station."

6) Figures 4-5, 4-6, 4-7, 4-8, 4-9, 4-10; Figures should be designated either as "Shallow" or "Principle" aquifer.

7) Page 4-1; The statement that "during the course of the Phase 1 RI, nonaqueous-phase liquids, either as dense NAPLs or light NAPLs, were observed in the monitoring wells" is not consistent with the DNAPL discussion on page 5-38.

8) Page 4-118; It would be useful to illustrate areas impacted by fuel related contamination on figures (i.e. as completed for benzene and other VOCs).

9) Page 4-205; Provide further rationale to justify that oxidation of FeS to Fe^{2+} and SO^{4}_{2+} is occurring.

10) Page 5-49; Please provide a range for groundwater temperature.

11) Page 5-53; Include further detail regarding the ratios of pyrite to Fe, Al, and Mn oxyhydroxides in sediments.

MEMORANDUM

DATE: August 30, 1994

SUBJECT: Comments to " Draft Operable Unit 1, Remedial Investigation Report, Marine Corps. Air Station, El Toro Calif.", Revision 0, July 1, 1994.

FROM: Rich Freitas, Hydrogeologist, Technical Support Section, H-9-3.

TO: Bonnie Arthur, Project Manager, Navy Section, H-9-2.

General Comments:

1) Extent of VOC Contamination in Ground Water. Figures 4-3 through 4-10 should be revised to show the data points used in the interpretation. The measured contaminant concentrations should be shown on the map adjacent to the appropriate well so the reader may evaluate the presented interpretation of the lateral extent of contamination. The well identifications and concentration data used to create this illustration should be tabulated and presented in the Figure legend or as a separate Table.

2) LNAPLs. It is unclear whether the screened intervals of the ground water monitoring wells were properly located to detected light non-aqueous phase liquids, e.g. JP-4, AvGas, etc., which will float at the top of the water table. Which wells are screened across the water table to detect these compounds?

3) DNAPLs. It remains unclear as to whether dense, non-aqueous phase liquids are present in ground water at the site. It should be noted that the existence of such compounds may greatly affect the feasibility, design and effectiveness of any proposed ground water extraction system.

4) Inorganic Water Quality. It would be useful to include the Stiff-type diagrams which were presented in Appendix J of the TM. Without such illustrations, it is very difficult for the reader to interpret the results of the inorganic analyses.

5) The Summary and Conclusions states that the source of high gross alpha and gross beta is due to natural sources however no real evidence is given to support this statement.

6) Other Contaminants. There are a number of contaminants which were detected in ground water which need to be illustrated as a Figure(s), e.g., chloroform, TFH-gasoline, TFH-diesel, arsenic, cadmium, chromium, gross alpha and beta, etc.

7) Field QA/AC Procedures, Laboratory QA/QC Validation. This information should be placed into the Quality Assurance Project Plan (QAPP). This plan should be updated and reviewed by EPA.

8) Summary Tables of Well Construction. These tables should by organized be well screen interval(s) rather than by time of installation (e.g., "Phase I" vs. "Previously Drilled Wells"). Organizing the wells by "shallow" vs "principal" aquifer will facilitate the interpretation of the ground water chemistry and water level data.

9) Summary Tables of Detected Contaminants. For ease of interpretation, the data presented in these Tables should be organized by depth, e.g. Shallow aquifer vs. "principal" aquifer.

10) Current Extraction System. The existing extraction well locations should be illustrated on the site map. The extraction well screen elevations in the aquifer system should be illustrated. The zone of capture of this well should be illustrated with contour maps of ground water elevation data. Such information is useful in future design.

Specific Comments:

1) page ES-1, para. 2, "The VOC plume, as defined by TCE concentrations greater than U.S. Environmental Protection Agency (EPA) maximum contaminant level (MCL) of 5 ug/L, extends off-Station approximately 2.5 miles to west beneath the City of Irvine. The average width of the plume is approximately 1/2 mile..."

   Comment: The illustrations presented in support of this interpretation did not include the data points. Therefore, I can not easily verify if this statement is correct.

2) page ES-1, last para. , "Groundwater modeling performed to support evaluation of FS alternatives indicates that the Desalter wellfield will extract groundwater flowing from MCAS El Toro"

   Comment: The results of the ground water modeling should be presented as an Appendix to this report so that I can evaluate the usefulness of the modeling effort.

3) page ES-7, para. 3, "Low concentrations of phthalates are commonly widely distributed in the environment.."

   Comment: To my knowledge, phthalates are man-made compounds which do not occur naturally in ground water or soils.

4) page ES-9, last bullet, "The existing data on the regional VOC contamination in groundwater support the decision to proceed with an Interim-Action FS and ROD"

   Comment: This project remedy is rather large scale to be considered for an "interim-action FS/ROD". Recommend the FS be complete before remedial action is initiated. Premature remedial actions may lead to poor design and unnecessary expenditures.

5) page 1-13, para. 3, "..an interim groundwater pump and treatment system was installed at this boundary..."

   Comment: The extraction well locations should be illustrated on the site map. The extraction well screen elevations in the aquifer system should be illustrated. The zone of capture of this well should be illustrated with contour maps of ground water elevation data.

6) page 2-2, Section 2.1.2, para. 2., "Level B PPE was used when drilling at some sites with suspected landfill gas emission.."

   Comment: Which gases are suspected to be present in these areas?

7) page 2-4, page 2-4, para. 3, "The SAP planned for 20 feet of well screen for each monitoring well, however...the well screen for almost all the shallow wells was increased to 40 feet..."

Comment: This is a rather long screen for a ground water monitoring well. A well with such a long screened interval may allow sample dilution, e.g. fresh water may enter the well and dilute the sample. Therefore, contaminant concentrations measured from such wells will probably underestimate the true contaminant concentrations that are within the aquifer.

Comment: Were any of these wells screened across the water table to enable detection of LNAPLs?

8) page 2-5, Table 2-1, "Summary of Well Completion..."

Comment: This table is probably better organized by well screen interval(s) rather than by time of installation (e.g., "Phase I" vs. "Previously Drilled Wells"). Organizing the wells in this manner will facilitate the interpretation of the ground water chemistry and water level data. In this way, once can easily discern which wells monitor the shallow aquifer and which monitor the deeper aquifer(s).

9) page 2-26, "Well 5E is a 2-inch-diameter piezometer used for static water level measurements only; this well is not equipped with a pump and is completed in a flush-mounted road box with a PVC cap"

Comment: Flush mounted type completion should be avoided if possible. Such construction allows the possibility of surface fluids/water runoff entering the well and contaminating ground water. For existing wells, the ground surface should be graded to route potential surface water runoff away from the well.

10) page 2-29, para. 2, "Aquifer parameters, including hydraulic conductivity and transmissivity, were calculated for about half of the wells by either pumping tests or slug tests..."

Comment: It is probably not necessary to test such a large number of wells. A few well designed long term pumping tests would yield much more useful information which could be used in the design of a ground water extraction system. Four-hour duration pumping tests are probably too short duration to be of much use in the design of a ground water extraction system.

11) page 2-31, para. 3, "If filtering was necessary, an in-line filter was used.."

Comment: EPA generally recommends against the filtering of ground water samples taken for analysis. Please refer to "EPA RCRA Ground-Water Monitoring Guidance, November 1992" for the latest EPA guidance on the sampling of ground water monitoring wells.

12) pages 2-33 through 2-37, Field QA/AC Procedures, Laboratory QA/QC Validation...

Comment: This information should be detailed in the Quality Assurance Project Plan (QAPP). This plan should be updated and reviewed by EPA. Information from the QAPP should be briefly summarized in this section of the report..

13) page 3-29, and 3-41

Comment: Figure 3-6 does not include a reference. Figs. 3-9a and 3-9b are presented in section 3.5.1; however, they are not discussed until section 3.5.2.1. They should be relocated.

14) page 3-106, last sentence, "Stiff-type diagrams,..modified to show potassium and nitrate concentrations separately, were plotted using the modified data. These diagrams are in Appendix J of the TM.."

Comment: It would be useful to illustrate and describe these diagrams in this section of the report. Without such illustrations, it is very difficult for the reader to interpret the results of the inorganic analyses.

15) Figures 4-3 through 4-10, *Contaminant concentrations in ground water.*

Comment: I can not check the interpretations that are presented. The measured contaminant concentrations should be shown on the map adjacent to the appropriate well so the reader may evaluate the presented interpretation of the lateral extent of contamination. The well identifications and concentration data used to create this illustration should be tabulated and presented in the Figure legend. Which data was used to create each of these illustrations?

Comment #2: The legend indicates that samples were collected somewhere within a three month period, e.g.,between the dates of Sept. 1992 to Feb. 1993. Did it take three months to complete sampling of these wells? Ideally, all ground water samples should be collected at about the same date.

Comment #3: Figures 4-5 through 4-10. Do these Figures represent concentrations observed in the shallow or deep ("principal") aquifer?

16) Tables 4-5, 4-6, 4-8, and 4-9, 4-10, 4-13, 4-14 4-15, 4-16.

Comment: For ease of interpretation, the data presented in this Table should be organized by depth, e.g. Shallow aquifer vs. "principal" aquifer.

17) page 4-85, 1st para. "A regional plume of TCE-contaminated groundwater...extends approximately 3 miles to the west..Average width of the TCE contamination is approximately 1 mile..The TCE plume..only extends off-Station approximately 2.5 miles to the west...The width of the 5 ug/l-plume is approximately 1/2 mile..."

Comment: see above comments to Figures 4-3 through 4-10.

18) page 4-87, para. 2, "The cis- and trans-isomers ... were not separately quantified in the laboratory analysis.."

Comment: Future lab analysis should attempt to quantify both the cis- and trans-isomers.

19) page 4-99, Chloroform,"Chloroform was detected at 49 groundwater sampling locations..."

Comment: Please illustrate as a Figure the wells in which this compound was detected..

20) page 4-99, 4-100, Methylene Chloride, Chloromethane, Other VOCs

Comment: Please illustrate as a Figure the wells in which this compound was detected.

21) page 4-118, Ethylbenzene, Xylenes, TFH-Gasoline, TFH-Diesel

Comment: Please illustrate the wells in both the shallow and "principal" aquifer which detected these compounds.

22) page 4-119,

Comment: Site numbers should be added to Figure 2-1 so that well locations can be related to sites. They should be in a format or font that makes them easily distinguishable from the wells.

23) page 4-119,

Comment: In the last sentence please identify whether the petroleum occurrences were detected in the first or second round. This is significant because it may help to clarify the previous comment related to the possibility of the introduction of contamination through the use of potable water as part of drilling operations.

24) pages 4-120 to 4-121,

Comment: There should be a discussion of the source of potable water at the base. What is the date and reference for the potable water samples which contained high fuel hydrocarbons? If potable water from the station was used in the drilling program, did the authors investigate the possibility that TFH-diesel contamination in the potable water supply may have resulted in the introduction of contaminants into the borings?

25) page 4-121, Phthalates
page 4-122, Pesticides and Herbicides.

Comment: Please illustrate the distribution of these compounds in both the shallow and "principal" aquifer wells..

26) page 4-132,

Comment: Expand general discussion of potential metal contaminant source areas. Include a discussion of the type of sludge and identify specific metals expected to be associated with source areas for other locations where plating occurred.

27) page 4-132,

Comment: In the third paragraph. The concentration of aluminum in BGMW19B (22 mg/l) is too high to be soluble (dissolved) at this pH value (Hem, 1985). It seems unlikely that this sample was actually filtered. It also contains high concentrations of other metals that wouldn't normally be found at these levels in filtered samples. Please check the field notes for this sample to be sure it was filtered.

28) page 4-132, Antimony, "Antimony was detected 135 times out of 324 samples, and each detected concentration was above the federal MCL of 6 ug/l"

Comment: Please display the wells which detected this compound.

29) page 4-181, Arsenic,Cadmium, Chromium,

Comment: Please display all concentrations which exceed MCLs as a single Figure. The discussions of these compounds should include a reference to their use in plating.

30) page 4-192,

Comment: In the third paragraph. Please identify the wells at Site 1 and confirm that concentrations are mg/L, not ug/L as stated in the text.

31) Table 4-14,

Comment: Is this Table is out of sequence?

32) page 4-215, Gross Alpha and Beta, "Seven out of 34 groundwater samples exceeded the federal MCL of 15 picoCuries/Liter...

Comment: Please display all wells whose concentrations exceed MCLs.

33) page 5-1,

Comment: In the second sentence of the first paragraph. Please edit to read as follows: "..released as a mixture of VOCs as free-product and as VOCs in aqueous solution. Thus, the VOCs may have infiltrated into the ground in either an aqueous phase or as a free-product liquid phase."

34) page 5-6, Figure 5-2,

Comment: The temperature under which the water solubility limits and vapor pressure are measured should be noted.

35) page 5-7,

Comment: Add sink "or float" to 1st sentence of the first paragraph, since preceding text included discussions about DNAPLs and LNAPLs.

Comment: In the fourth paragraph. While it is true that the highest groundwater TCE concentration found at well 09_DBMW45 is not indicative of a DNAPL source, at this time there is insufficient information to strongly support the authors conclusion. The Phase II RI will attempt to verify this assertion; however the observation of VOC concentrations less than 1 percent of the aqueous solubility limit does not preclude the presence of NAPLs (EPA, 1993). Additional wells and groundwater monitoring will be part of a comprehensive Phase II program to verify this conclusion.

36) page 5-16

Comment: In the third paragraph, include more discussion of determination of soil TOC content. What areas of the site were sampled and at what depths? Page 3-11 (3.4.3 soil properties) does not include mention of TOC among the measured soil properties. This is important because the TOC range is used to generate Figure 5-3. Most significantly, the presentation needs to identify the fact that partitioning of VOCs into organic matter on soil is based on linear sorption isotherms which are not applicable at the low organic carbon contents found at the station. Therefore, although the presentation and illustration (Figure 5-3) is interesting, the main point that needs to be emphasized is that partitioning into organic matter is negligible within the subsurface. The authors should develop a new discussion which reviews the primary mechanisms for sorption at the station.

37) page 5-61, last para., "Stiff and Piper diagrams.."

Comment: These Figures should be presented in this report.

38) page 6-18,

Comment: The fourth paragraph states that the source of high gross alpha and gross beta is due to natural sources however no real evidence is given to support this statement.

References:

EPA, 1993, DNAPL Site Evaluation, Robert S. Kerr Environmental Research Laboratory, Ada, Oklahoma, EPA/600/R-93/022, February 1993.

Hem, J.D., 1985, Study and Interpretation of the Chemical Characteristics of Natural Water, USGS Water Supply-Paper 2254.