



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street  
San Francisco, Ca. 94105-3901

June 1, 1992

Stephen Chao  
Western Division  
Naval Facilities Engineering Command  
900 Commodore Way, Bldg. 101  
San Bruno, CA 94066-0720

Dear Mr. Chao:

The U.S. Environmental Protection Agency (EPA) has reviewed the April 1992 remedial investigation (RI) reports and baseline risk assessments for Operable Unit 2 (OU 2) and Operable Unit 4 (OU 4), for the NAS Moffett Field NPL site. We have the enclosed comments at this time. Comments were provided by our Technical Support Section, and our representative, Science Applications International Corporation.

We recognize that considerable effort has gone into the data collection, analysis and report preparation efforts required to produce these documents. However, our comments raise a number of significant issues that must be addressed. In addition to the enclosed comments, we wish to bring the following items to your attention.

First, it is EPA's position that unsubstantiated statements regarding the relative contribution of contamination to the plume should be eliminated from these reports. An example of such a statement can be found in the OU 4 RI on page ES-3: "The contribution of Moffett Field activities to TCE groundwater contamination is also minor." Such statements are scattered throughout the OU 2 and OU 4 RI reports. The purpose of an RI Report is to document the nature and extent of contamination, and not to apportion liability among responsible parties.

Second, we understand that some additional characterization at OU 4 is presently ongoing. Since this information will not be available in the Draft Final RI report, we reserve our right to comment on this additional RI information prior to our approval of the FS.

Finally, with regard to the relationship between the MEW and Moffett sites, we have previously informed you of our position that the MEW ROD should be incorporated into the Moffett Field FS for OU 4. In order to have a coordinated cleanup effort, it is im-

portant that the conclusions in the OU 4 FS be consistent with the MEW ROD. The OU 4 Draft Final RI report should address this issue.

We look forward to your response to our comments. Please call me at (415) 744-2385 if you have any questions.

Sincerely,



Roberta Blank  
Remedial Project Manager

Enclosures (6)

cc: Jim Hass, NAS Moffett Field  
Cyrus Shabahari, DTSC  
Elizabeth Adams, RWQCB

MEMORANDUM

May 29, 1992

Subject: Comments to the report, "Remedial Investigation Report, Operable Unit 4: Westside Aquifers, NAS Moffett Field, California", by Martin Marietta Energy Systems, Inc., April 1992.

From: Rich Freitas, Hydrogeologist *RF*  
Technical Support Section, Superfund H-8-4.

TO: Roberta Blank, Remedial Project Manager,  
Federal Enforcement Section, H-7-5

Roberta,

My overall impression is that significant effort has gone into the collection, analyses and preparation of the report; however, I have a number of comments which are outlined below. There are some more details such as the aquifer analysis, the ground water computer model and the data validation methods/procedures which I would like to take a closer look at. These comments are generally limited to site characterization and ground water data presentation/evaluation. I did not comment on the Ecologic and Risk Assessment portions of this document. These sections should be reviewed an Ecologist and Toxicologist.

**General Conclusions and Recommendations.**

1) From information presented in the report, there appears to be both PCE, and TCE releases to ground water on-site. This is evidenced by the PCE and TCE "hot spots" in ground water illustrated in Figures 4.2-3 through 4.2-8 and Figures 4.2-9 through 4.2-14. There also appears to be significant TPH sources (fuel) to ground water on-site (Figure 4.2-8A). The other chlorinated compounds present in ground water may be breakdown products of the PCE/TCE (e.g., 1,1-DCE, 1,2-DCE, 1,1-DCA). Although, the upgradient TCE in ground water may be from another source, however, this has not been conclusively demonstrated in the report. Ground water gradients may historically have been reversed and the base may be the only source of this compound. The complete lateral extent of these compounds in ground water need to be described and illustrated.

2) Although there appears to be sufficient information to do so, the lateral extent of ground water contamination for individual compounds within specific aquifers has not been completely delineated. The contour maps showing contaminant concentrations should be re-drafted to show lower concentration data, e.g., 1 to 100 ppb concentrations for PCE in the A1 aquifer. In this manner, the full lateral extent of the contaminant release to ground water may be defined.

3) Insufficient detail has been provided concerning the inorganic water quality beneath the site. I am not sure that I am comfortable with using only four selected wells from which "background" inorganic water quality is determined. A better method would be to use all inorganic chemistry data to plot "Stiff diagrams". This may assist in determining which portions of the aquifer may be affected by salt water intrusion and which may have been affected by disposal activities at the site. Statistical analyses of the inorganic ground water data may be useful in defining "background" water quality.

4) I do not know if the data validation package has not been submitted to EPA with this report. You may wish to verify ground water analyses results with an EPA round of sampling.

5) The velocity and direction(s) of contaminant migration at the NAS should be calculated. I am concerned that the ground water contamination may eventually discharge into the nearby wetlands and possibly impact the ecosystem there.

6) The computer ground water models MODFLOW and MOC should only be used as a tool in the decision making process. It should be emphasized that these models may have a high degree of uncertainty. If this model is to be used in the decision-making process, the input-output files of the model, the model code and documentation should be submitted to EPA for review.

#### Specific Comments:

1) page ES-1, para. #2,  
Text: "The primary chemicals of concern are waste oils and jet fuels, solvents and cleaners, washing compounds, and minor amounts of gasoline, hydraulic fluids, asbestos, paints, pesticides, battery acid and polychlorinated biphenyls (PCB)."

Comment: Some but not all of these compounds have been detected in soils and ground water on the base. What happened to those compounds that were used on the base (e.g., pesticides) that have not been detected? Were soil and ground water samples analyzed for these compounds (e.g. pesticides)? I'm concerned since this area is so near a potentially sensitive ecosystem.

- 2) page ES-3, para. #2,  
Text: .."Groundwater contamination...The primary contaminant of concern is TCE.."  
  
Comment: Some discussion as to the velocity and direction of contaminant migration should be discussed here. The environmental fate of TCE should be briefly discussed.
- 3) Page ES-3, para. #3,  
Text: .."The contribution of Moffett Field activities to TCE groundwater contamination is also minor.."  
  
Comment: I am not sure why the TCE contamination from Moffett Field activities is characterized as "minor".
- 4) page 1-3, para. #3,  
Text: "Much of the area north of the middle of the airfield has been filled to present elevations with materials of unknown composition.."  
  
Comment: These areas should be investigated to determine what has been placed in these areas.
- 5) Section 1.4, Archaeological Sites,  
Comment: How will the presence of these sites affect remedial actions ?
- 6) Section 1.5, Operable Unit Definition,  
Comment: Do the six operable units define all potentially contaminated areas ?
- 7) Section 1.6,  
Comment: Has EPA conducted its own PA/SI ? If so, how do the findings compare with information presented in this section ?
- 8) Figure 1.5-1  
Editorial Comment: This Figure should have a legend which explains the symbols which are used.
- 9) para. #2,  
Editorial Comment: Reference should be made to Figure 1.6-3 for the locations of Tanks 19,20.
- 10) para. #3,  
Text: "Three abandoned deep water wells are at the upgradient edge and near the southwest corner of Site 9. These wells intersect several aquifers. The wells are believed to be approximately 1,000 feet deep."

**Comment:** The locations of these wells should be illustrated on Figure 1.6-2. How were these wells "abandoned" ? Were they properly sealed ? Could these wells be acting as conduits for contaminant migration to deeper portions of the aquifer ?

- 11) Figure 1.6-3  
**Editorial Comment:** On what Figure are Tanks 15 and 21 illustrated.
- 12) Section 1.6.3, Site 10,  
**Editorial Comment:** The information presented in this section is a bit disorganized. The reader must flip back and forth between text and Figures to determine locations of potentially contaminated areas. Not all locations are illustrated on the Figures. Some storage areas are indicated on Figures but not discussed in the text.
- 13) Figure 1.6-3,  
**Comment:** The following tanks are indicated on the Figure but not described in this section of the report: Tanks 32, s41B, 70, 71, 86A, 86B, 87, and 91.
- 14) page 1-10,  
**Comment:** On which Figure is sump 24 and Tank 14 located ?
- 15) page 1-11, Tank 57, 67, 68.  
**Comment:** The locations of these tanks are illustrated on Figure 1.6-3.
- 16) page 1-11,  
last line, .." Tank 67 contained..."  
**Editorial Comment:** Should this read, "Tank 68 contained.." ?
- 17) page 1-14, tank 14,  
**Editorial Comment:** The location of this tank should be referenced to a Figure.
- 18) page 2-1, para. #4,  
**Text:** "The Golf Course Landfill, Site 2, was not recommended for a CS. The IAS reached the decision based on the IAS conclusions that human health and the environment would probably not be threatened from any contamination from Site 2 because of its age of the site and that groundwater from the site would probably not enter San Francisco Bay".  
  
**Comment:** Has EPA been given the opportunity to review the IAS ?

- 19) page 2-2, 1st sentence,  
Text: "Included in the OU4 investigation are Sites 8, 9, 10, 12, 14, 16, 17, and 18".
- Comment: Why were these sites included into OU4 and others excluded ?
- 20) page 2-3, Potential Vertical Conduits,  
Comment: Have the referenced studies been reviewed by EPA ? Shouldn't this information be included into this report ?
- 21) page 2-3, last para., "Two inactive wells, 14MO1 and 14MO2, were sampled as part of the CS"
- Comment: The locations of these wells should be illustrated on the site map.
- 22) page 2-4, para. #5, Text: .."These ponds do not impact groundwater on the west side of Moffett field"
- Comment: What data indicates that the ponds are not impacting ground water at Moffett field ?
- 23) page 2-5, para. #2, .."based on data collected from monitoring wells located upgradient and downgradient of the ponds, there is no indication that the ponds are affecting groundwater quality"
- Comment: The data from which this interpretation was made should be included in this report for evaluation.
- 24) page 2-8, para. #1,  
Comment: Where are the free product monitoring wells located ? Has any free product be found in these/other wells ? If so, this product should be removed immediately.
- 25) Section 3.3,  
Comment: Has any sampling been performed along the Perimeter Ditch and the Marriage Road Ditch ? Where do these ditches discharge ?
- 26) page 3-4,  
Text: "The remaining runoff from Moffett Field is collected in a network or catchment basins that drain into the Perimeter and Marriage Road ditches and underground storm drain system (Figure 3.3-1). The storm water flows into a sump and is then pumped over a dike into an off-site canal that drains into Guadalupe Slough."

**Comment:** Has any water quality analyses been made of this runoff water ? This runoff may drain into a sensitive ecosystem.

- 27) page 3-12, para. #2, .."more generic bay area background levels suggested by the USGS (1984) are listed in Table 2.3-1" ..

**Comment:** This should be Table 3.5-1.

- 28) Section 3.6.4,  
**Comment:** This section should include calculations of ground water flow velocity which could then be used to estimate velocity of contaminant migration in the ground water.

- 29) page 3-22, Horizontal Gradients,  
Text: "Potentiometric surface contour maps for the A1 and A1 aquifer zones on the west side of Moffett Field for August 1991 are presented in Appendix C."

**Comment:** These maps are located in Appendix A. The maps are critical to the interpretation of the ground water chemistry data and determination of ground water flow and contaminant transport at the site. These maps should be included as Figures in Volume 1 of the report.

- 30) page 3-23, last para.,  
**Comment:** Reference is made to Figure 3.6-9 which is not include in this report. Should reference be made to Figure 3.6-6 instead ?

- 31) page 4-1, para. #3, "Six sampling rounds were conducted..."

**Comment:** On what dates were these sampling rounds conducted ? Which wells were sampled during each round of sampling ? Which chemical parameters were measured during each round of sampling ?

- 32) page 4-1, last para. "The other rounds of analytical results are also evaluated where appropriate but are not presented in the summary tables.."

**Comment:** All data collected to date should be presented in the summary tables.

- 33) page 4-1,4-2 last sentence, "Phase II groundwater analytical data representing all monitoring wells sampled during the four quarters are presented in Appendix B"

**Comment:** On what dates were the Phase II samplings conducted ?

34) page 4-6, Section 4.2.1,

**Comment:** The use of a single background well for each of the aquifer zones A1, A2, B3 and C, may not be representative. It may be useful to plot Stiff diagrams for all inorganic water quality analyses taken during a sampling round. In this manner, it may be possible to distinguish between areas of saline water intrusion and areas affected by base disposal/storage operations. A statistical analyses of existing inorganic ground water analyses data may be of use.

35) para. #4,

**Comment:** Which dates were the wells sampled ?

36) Table 4.2-1

**Comment:** How many sample values were averaged ? The data values that were averaged should be tabulated ? The detection limit should be indicated for all cases of "non-detect". There is a considerable variation in water quality with depth.

**Comment:** Some discussion of general water quality should be included.

37) Figures 4.2-3,

**Comment:** Appears to indicate PCE "hot spot" under Tank 68.

38) Figures 4.2-3 through Figure 4.2-14,

**Comment:** Should show contour lines for the lower concentrations, e.g., contour lines stop at the 100 ppb concentration level for PCE and TCE in the A1 zone aquifer, What is the lateral extent of concentrations ranging from 1 to 100 ppb ? As presented, the reader can not easily determine the full lateral extent of PCE in the illustrated areas. The date(s) for which the wells were sampled should be indicated on the Figure. Cross-sectional views of the contamination would be useful. The "X,Y coordinates" and surveyed well elevations should be referenced in a Table.

**Comment:** The date(s) for which concentrations were measured should be indicated on the figures since concentrations will vary with time.

- 39) page 4-7, last para.,  
**Comment:** This section should describe the complete lateral extent of PCE in the A1 aquifer. The complete lateral extent of PCE in this zone should be illustrated on Figure.2-3.
- 40) page 4-8, para. #4, "NASA is located between Sites 8 and 9 and may be another source of TCE"  
  
**Comment:** What information indicates that NASA may be a source of TCE in the A1 aquifer ?
- 41) page 4-8, 4-9, TCE.  
**Comment:** From the pattern of TCE contamination illustrated as Figures 4.2-3 through 4.2-8 and Figures 4.2-9 through 4.2-14, there does appear to be an on-site source of TCE to ground water in the vicinity. The TCE is located in the same general area as the PCE contamination to ground water which has been attributed to on-site disposal activities. The TCE may be related to this same on-site source.  
  
**Comment:** The complete lateral extent of TCE in ground water should be illustrated.
- 42) Page 4-9, 1,2-DCE,  
**Comment:** The pattern of 1,2-DCE contamination illustrated as Figure 4.2-6 indicates an on-site source of this compound. This is in the same general area as dry cleaner sump which is the suspected source of PCE in ground water of the area.
- 43) page 4-10,  
**Text:** .."soil sample and soil gas survey results indicate there is no known surface source of 1,1-DCE contamination in the vicinity of Site 9"  
  
**Comment:** The pattern of 1,1-DCE contamination in ground water appears to indicate an on-site source which may be related to the PCE, TCE and 1,2-DCE contaminant releases to ground water.
- 44) page 4-11,  
**Text:** "There are no data to indicate other possible Moffett Field sources of the 1,1-DCA contaminant plume"  
  
**Comment:** Could this compound be a breakdown product of TCE released to ground water from dry cleaner sump ?
- 45) Section 4.2.2.2, Other compounds,  
**Comment:** The complete lateral extent of JP-5, BTEX should be illustrated. The full extent of TPH

contamination of ground water should also be illustrated. The extent of TPH illustrated as Figure 4.2-8a only illustrates those concentrations over the 1,000 (ug/l?) concentration. These contaminants do appear related to site activities.

- 46) page 4-13, Vinyl Chloride,  
**Comment:** The lateral extent of this compound in the A1 zone aquifer should be illustrated.
- 47) Section 4.2.2.3,  
**Comment:** All inorganic compound data collected at the base for ground water analyses should be tabulated in one Table. It is not clear to the reader as to why only data from sites 8, 9, 12 and 14 are discussed in this section of the report.
- 48) page 4-13, para. #3, "Table 4.2-3 identifies which metals concentrations are above the background (see Section 4.2.1)."  
**Comment:** I don't see on this Table where the metals concentrations are compared to "background" concentrations. Please explain. Individual concentration measurements should be illustrated.
- 49) page 4-13, para. #4, "Table 4.2-3 identifies which metals concentrations, by well, were found above the background (see Section 4.2.1)."  
**Comment:** See above comment relating to this Table.
- 50) page 4-14, Lead,  
**Comment:** Were leaded fuels used at Moffett AFB? If so, could these be a source of lead to ground water at the site?
- 51) Table 4.2-1,  
**Comment:** Were concentrations reported as ppb or ug/l?
- 52) Tables 4.2-2 and 4.2-4, 4.2-6,  
**Comment:** These tables are for "Selected Compounds". Any other compounds detected? If so, they should be tabulated.

**Comment:** Need a legend to explain the chemical abbreviations, e.g., VC-Vinyl Chloride? Do blank rows/column (boxes) indicate the compound was not analyzed for this compound or was the compound not detected? Non-detected compounds should illustrate the detection limit, e.g., <5 ug/l. Is data for all sampled wells tabulated here? Which figure illustrates the locations of the sampled wells?

- 53) Tables 4.2-3, 4.2-5, 4.2-7  
**Comment:** The actual data which has been summarized should be referenced as a Table. The laboratory data sheets should be submitted in support of the data.
- 54) page 4-19, Vinyl Chloride,  
**Comment:** How many wells were sampled for this compound ?
- 55) page 4-16, "..free product wells.."  
**Comment:** Where are these wells located (well #) ? Have these wells detected "free product", e.g., jet fuel/gasoline ?
- 56) page 4-16, PCE,  
**Comment:** The complete lateral extent of PCE in the A2 zone aquifer should be described and illustrated. All analyses of ground water for PCE in the A2 aquifer should be tabulated.
- 57) page 4-17, para. #2, "The source of TCE present in the A2 aquifer zone is the same as that for the TCE in the A1 aquifer zone. There are no documented potential Navy sources for TCE on Moffett Field.."  
**Comment:** The distribution of TCE at Moffett indicates an on-site source. The complete lateral extent of TCE in the A2 aquifer zone should be described and illustrated.
- 58) page 4-17, 1,2-DCE,  
**Comment:** The distribution of 1,2-DCE in the A2 aquifer zone indicates an on-site source. The complete lateral extent of 1,2-DCE should be described and illustrated.
- 59) page 4-18, para. #3, "Possible sources of 1,1-DCE present in the A2 aquifer zone at Sites 8 and 9 are the same for those of TCE"  
**Comment:** The distribution of 1,1-DCE present in the A2 aquifer zone at Site 8 and 9 indicates an on-site source in these areas. The complete lateral extent of this compound should be described and illustrated.
- 60) Page 4-18, para. #5,  
**Text:** "The main source of TCA in the A2 aquifer source of TCA in the A2 aquifer zone is an upgradient location...It is also possible that the Dry Cleaners' sump could have contained TCA"

**Comment:** From the distribution of TCA in the A2 aquifer, it does appear that the Dry Cleaner sump may have been the source of this compound. It is not clear from this report as to whether any other sources of TCA exist. The complete lateral extent of this compound in the A2 aquifer should be described and illustrated.

61) page 4-18, DCA

**Comment:** The complete lateral extent of this compound in the A2 aquifer should be described and illustrated.

62) page 4-19, Other Organic Compounds,

**Comment:** The complete lateral extent of JP-5 and toluene should be described and illustrated.

63) page 4-20, 4.2.3.3 Inorganics,

**Comment:** All ground water analytic data for inorganics should be tabulated and placed into this report.

64) page 4-22, Lead,

**Comment:** Were leaded fuels used at this site? If so, could these be the source of lead in ground water?

65) page 5-3, para. #2,

**Text:** "The primary contaminant of concern is PCE, known to originate at MEW"

**Comment:** This statement implies that MEW is the main source of PCE in ground water which has not been clearly demonstrated in this report.

66) **Text:** "Free-phase TCE has not been observed in the Moffett Field aquifer zones, and observed concentrations are wells below the solubility limits of TCE, which suggests free-phase solvents are not present at Moffett Field"

**Comment:** What is the range of observed concentrations and what is the solubility of TCE? The "rule of thumb" is if the concentration of an individual VOC exceeds 10% of the solubility limit, then free-phase is somewhere present.

67) page 5-16, para. #4, "Impact of the aquifer system at Moffett Field by organic compounds (TCE) can be largely explained by invasion of a plume from an upgradient source"

**Comment:** Although possible, this case has not been clearly demonstrated in this report.