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

February 1, 2000

Commanding Officer
Engineering Field Activity, West
Naval Facilities Engineering Command
Attn: Mr. Stephen Chao
900 Commodore Drive
San Bruno, CA 94066-2402

Dear Mr. Chao:

The U.S. Environmental Protection Agency has reviewed the August 1999 Draft Quarterly Report for the Moffett Federal Airfield site, dated December 30, 1999. Our comments are attached. We did not repeat any of the generic format type comments made in our prior letter on the May Quarterly Report; as we agreed to meet to further discuss those. Please contact me at (414) 744-1685 if you have any questions regarding the attached.

Sincerely,

Roberta Blank

Roberta Blank

Attachment (8 pages)

cc: Mr. Ed Dias, Navy, Southwest Division
Mr. Joseph Chou, RWQCB
Ms. Sandy Olliges, NASA
Ms. Eugenia Chow, EPA
Mr. Tim Mower, TtEMI

Review of the Moffett Federal Airfield
August 1999 Draft Quarterly Report
Dated December 30, 1999

GENERAL COMMENTS

1. The August 1999 Draft Quarterly Report (Report) does not include an executive summary. To facilitate the review process, please add an executive summary to the Report.

2. The Report states that Moffett Federal Air Field (MFA) has installed a sodium dithionite pilot test system to evaluate the feasibility of a In-Situ Abiotic Redox Manipulation (ISRM) system as a replacement for the pump-and-treat groundwater remediation systems at MFA. However, the Report does not indicate when the injection test is scheduled to be performed and whether a work plan has been submitted to the regulatory agencies for review. Therefore, please revise the Report to provide an injection test schedule and a reference to an approved work plan.

3. The Report refers to field work performed at the Petroleum Sites and the Northern Channel Corridor. However, the Report does not provide a reference to approved work plans or background information regarding this work. Therefore, please revise the Report to include background information regarding the field work performed at the Petroleum Sites and the Northern Channel Corridor or a reference to approved work plans.

4. The Report does not discuss the status of the Stanford study which was supposed to be performed at MFA. Since the Enhanced Natural Attenuation of Commingled Plumes technology requires the injection of compounds into groundwater that are themselves pollutants and may not provide hydraulic capture of the contaminant plumes, it is essential that the regulatory community be updated on the progress of the study. Therefore, please revise the Report to include information regarding the status of the Stanford study.

5. The Report makes a distinction between monitoring West-Side Aquifer Treatment System (WATS), East-Side Aquifer Treatment System (EATS) and the remaining Comprehensive Long-term Environmental Action Navy (CLEAN) program wells, but does not elaborate on why the remaining CLEAN program wells are monitored. WATS and EATS wells were monitored in June 1999. The remaining CLEAN program wells were monitored in August 1999. In addition, the data presentation is separated into EATS, WATS and CLEAN program wells. For clarity, please revise the Report to clearly state that CLEAN well results refer to the data collected from monitoring wells that are not part of the WATS and EATS and what the objectives are for monitoring these CLEAN program wells.

6. The Report (Section 3.0, Page 9 and Section 4.4, Page 13) refers to Table 5 as presenting a list of monitoring wells sampled in August 1999. Tables 1 and 2 present monitoring well

analyses for the WATS and EATS monitoring wells. Since the wells listed in Table 5 are not part of the EATS or WATS and only the monitoring objectives for the EATS and WATS are discussed in the Report, it is unclear what the sampling objectives for the wells listed in Table 5 are. For clarity, please revise the Report to indicate the objectives for the August 1999 sampling event as opposed to the June 1999 (EATS and WATS) sampling event.

In addition, the Report should refer to Tables 1 and 2 as presenting monitoring well analyses for the WATS and EATS aquifers monitoring wells, respectively, rather than just calling them the monitoring wells sampled in June1999. For clarity, please revise the Report to more accurately describe the information presented in Tables 1, 2, and 5.

Furthermore, the Report (Section 3) incorrectly states that Table 5 includes the aquifer zone monitored. Please revise the Report to eliminate the reference to aquifer zones on the bottom of Page 9.

7. As shown in Table 3, many of the detection limits were above the regulatory cleanup levels for the detected compounds. However, the Report does not discuss this fact with respect to data usability. In addition, Figures 5 through 12 are based on the data presented in Table 3. Due to the elevated reporting limits for many of the compounds shown in the figures, it appears appropriate that instead of depicting the results in the figures as not detected for these compounds, that these data points not be used for contouring. If an estimated concentration can be determined from the laboratory data, the estimated concentration should be used. Otherwise, the plume shape should resemble the plume shape depicted in previous monitoring reports. Please revise the Report to discuss the usability of the data where elevated reporting limits had to be used and revise Figures 5 through 12 to eliminate data points for which the reporting limit exceeded the regulatory cleanup level or use the laboratory estimated concentrations whenever possible. In case not enough data points can be used for contouring, please depict the same plume shape as shown in previous monitoring reports.

8. As shown in Table 3, the regulatory cleanup levels were exceeded for 1,1-DCA, 1,1-DCE and trans-1,2-DCE. However, no concentration contours are provided for these compounds. Since these compounds exceeded regulatory levels in groundwater, please revise the Report to include the rationale for not providing concentration contours for these compounds or add concentration contours to the Report.

9. The Report only discusses the analytical results of the August 1999 samples in Section 5.4 which is entitled "Summary of Organic Constituents". However, a summary of organic constituents should also discuss the VOC sampling results for samples collected in June 1999. Since there is no discussion provided regarding the VOC sampling results for the June 1999 sampling event in Section 5.4, please revise the Report to include a discussion of June 1999 sampling results or reference Sections 2.1.1 and 2.1.2 for this information.

In addition, the Report does not provide a discussion or data tables for the organic lead,

PAHs and MTBE analyses results from the August 1999 sampling event. For completeness, please revise the Report to include a discussion of the organic lead, PAHs and MTBE analyses results from the August 1999 sampling event and provide data tables for these compounds, if appropriate.

10. In order to facilitate the review process, please revise the Report to add the regulatory cleanup levels to Tables 3, 4 and 13.

11. In order to facilitate the review of the groundwater contour and capture zones maps, the Report should include a table listing the average monthly groundwater pumping rate for each extraction well shown in Figures 18, 19 and 21. Therefore, please revise the Report to include such a table.

12. As discussed during the last Remedial Project Managers (RPM) meeting, insufficient data points are available to draw reliable "estimated capture zones" around the extraction wells as presented in Figures 18, 19 and 21. For example, the southwest corner of the Figure 19 capture zone has been arbitrarily drawn. The closest monitoring well is located 250 feet away. Therefore, it is recommended that dashed lines be used in the areas where insufficient information exists rather than drawing an arbitrary capture zone.

    In addition, since there is no discussion in the Report regarding the lack of data points to draw reliable "estimated capture zones", please revise the Report to indicate that the installation of additional groundwater monitoring points are planned to better define the extent of the capture zones around each extraction well. See also Specific Comments 10, 11 and 12.

13. Figures 5 and 9 show vinyl chloride concentration contours for concentrations over 100 ug/l. However, since the regulatory cleanup level (MCL) for vinyl chloride is 0.5 ug/l, it may be appropriate to include in the figures a contour depicting the extent of vinyl chloride concentrations exceeding the regulatory cleanup level.

    In addition, since vinyl chloride was detected at 140 ug/l at EA1-6 and at 102 ug/l at EA2-2 (see Figure 5), a "100 ug/l" concentration contour should be drawn around these two wells. Therefore, please revise the figures to include "100 ug/l" contours around EA1-6 and EA2-2. Furthermore, please add a "0.5 ug/l" contour to Figures 50 and 9. Similarly, please add contours depicting the respective regulatory cleanup level to all of the concentration figures in the Report.

14. A significant decrease in TCE concentrations between May and August 1999 was observed at wells W9-33 and W9-8 (concentrations at these wells detected in May 1999 were 3,420 ug/l and 879 ug/l, respectively and less than 50 ug/l in August 1999). Such a drastic decrease in concentrations in such a short period of time is surprising. Possible explanations may be that the samples were mislabeled or that the wrong wells were sampled, but no reason for this rapid decrease is given in the Report. Therefore, the data should be validated, historical TCE

concentrations for these wells should be reviewed and discussed in the Report and the significant TCE decreases should be explained. It is recommended that future Groundwater Monitoring Reports contain tables of historical groundwater quality so that significant changes can easily be identified as Appendix A of the Report does not include historical data for W9-33 and W9-8. In the meantime, the TCE data for W9-33 and W9-8 should not be used for drawing TCE plume isoconcentration contours in Figure 11.

15. The Report does not address planned improvements to either the EATS or WATS. For example, to improve groundwater extraction and the development of a capture zone around well EA1-1, further improvements are planned. However, the Report does not discuss these improvements ~~are~~ planned. For completeness, please revise the Report to include a discussion of planned improvements to the EATS and WATS.

SPECIFIC COMMENTS

1. **Section 2.1.1, Page 7, Table 3 and Figures 5 through 12:** The text of the Report and the table state that "Analytical results for prevalent organic constituents on the west side of the runways" are listed in Table 3. However, it is unclear what is considered a "prevalent" organic constituent. The organic constituents what were detected at concentrations in excess of the respective laboratory method reporting limits should be listed in Table 3 and Figures 5 through 12. For clarity, please revise the Report to explain which criteria were use to define a "prevalent" constituent and revise the table and figures, if necessary, to include all concentrations detected above the respective laboratory method reporting limits or groundwater cleanup level, whichever is lower. The same should be done for Table 4 and Figures 13 through 16 with respect to the organic constituents detected on the east side of the runways.

2. **Section 4.3, Page 12 and Table 6:** The Report states that depth to water measurements were conducted at 462 monitoring wells. However, according to Table 6, depth to water measurements were conducted at only 433 wells. Please revise the Report to eliminate this discrepancy. If fewer than 462 measurements were taken, please explain what prevented the collection of water level data from the remaining wells.

3. **Section 4.4.1, Page 13 and Table 7:** The Report states that "Table 7 summarizes the percent completion of field samples..." and Table 7 lists the percent fulfillment of the sampling objectives. However, the Report does not explain what the sampling objectives are, which parameters are evaluated and why the percent fulfillment for the TPH-P analysis was only 62 percent. For clarity, please revise the Report to address these issues.

   In addition, the percent fulfillment criterion is not discussed in the QAPP for the Site. Instead, the criterion of completeness is discussed in the QAPP. Percent completeness is defined as "Number of useable sample results" divided by "Total number of sample results" multiplied by a factor of 100. However, the completeness criterion is not discussed in the

Report. The criterion of "fulfillment" as used in the Report is not the same as "completeness". Completeness is a measure of overall sampling program completion whereas fulfillment takes into account only the fulfillment of QA/QC data collection requirements. Since completeness has not been discussed in the Report, please revise the Report to discuss the percent completeness achieved during the August 1999 sampling event.

4. **Section 4.4.1, Page 13:** The Report states that between June 21 and 24, 1999, "Fifty-seven samples were analyzed for VOCs..." However, Table 1 indicates that fifty-seven samples were analyzed for VOCs at the WATS and Table 2 indicates that forty-three samples were analyzed for VOCs at the EATS between June 21 and 24, 1999. For clarity please revise the Report to resolve this discrepancy.

5. **Section 5.2, Page 16:** The Report states that "An independent firm validated results to evaluate agreement with DQOs." However, in the next paragraph it is stated that TtEMI "...completed full validation on 10 percent of the analytical data. One-hundred percent cursory validation was completed for the remaining VOC analyses." A similar statement is made for the metals analyses on Page 16. On Page 17, the Report states that "For analytical results for metals, the independent firm completed the full and cursory validation..." It is unclear, which company performed the data validation, an independent firm or TtEMI as the Report states in Section 4.4.2 (Page 14) "The data packages were submitted to an independent validation firm." Therefore, please revise the Report to clarify which company performed the data validation (include the name of the independent validation company) and clearly state which data deliverables were validated by which company.

6. **Section 5.3.1.5, Page 20 and Table 11:** The Report states that "Table 11 summarizes the equipment rinsate results". However, Table 11 only shows the results of one equipment rinsate (ERM-100). In addition, Table 11 shows that benzene, toluene and gasoline were detected in the rinsate blank. However, the Report does not address how detection of contaminants in the rinsate blank (and therefore presumably on the equipment used to collect a sample) can be avoided in the future. Therefore, please revise the Report to include all rinsate results in Table 11 and provide a discussion regarding how future contamination of equipment will be avoided.

7. **Section 5.4, Page 21:** The Report does not include a reference to the objectives of the August 1999 sampling event. For clarity, please revise the Report to indicate why the wells listed in Table 13 were sampled and what the analytical results will be used for. Currently, the Report only references the samples listed in Table 13 by the sampling date which does not provide enough information regarding the evaluation criteria for these wells. For clarity, please revise the Report to indicate why the samples listed in Table 13 were collected as they are not part of the EATS or WATS monitoring program.

8. **Tables 9 and 10:** Neither of these tables include results for the VOC analyses. Since VOCs are the main contaminants in groundwater at the Site, please revise the tables to include the QA/QC data evaluation for VOCs.

9. **Table 10:** The table lists "percentage of calculated RPDs greater than 25 percent" and lists 1% for PAHs and 50% of TPH-P. However, for PAHs only one of the 16 compounds was actually detected and, therefore, the RPD was only calculated for this one compound. As such, the entry in the column "percentage of calculated RPDs greater than 25 percent" should be 100% rather than 1%. Similarly, since only one of the two compounds was detected in the TPH-P analysis and, therefore, the RPD was only calculated for this compound, the entry in the column "percentage of calculated RPDs greater than 25 percent" should be 100% rather than 50%. Please revise Table 10 to correct this error. In addition, it would be helpful if Table 10 referenced Table 12 for additional information on the actual field duplicate concentrations and calculated RPDs. Therefore, please revise Table 10 to include a reference to Table 12.

   It appears that none of the field duplicate results met the QAPP acceptance criterion. Since 100% of the data failed to meet the RPD requirements, please revise the Report to provide an explanation as to why the field duplicate results varied to such a high degree. It may be appropriate to collect field duplicate samples from monitoring wells that are more highly contaminated so the RPD can be calculated for more compounds.

10. **Figure 11:** The TCE concentration contours show two separate plume "fingers". However, Figure 11 of the "May 1999 Draft Quarterly Monitoring Report" dated October 4, 1999 shows only one continuous plume. The reason for separating the plume into two "fingers" appears to be the analytical results from samples collected at W9-33 and W9-8, which indicated that TCE was not detected above the reporting limit of 50 ug/l. However, it is inappropriate to assume that the concentrations detected at W9-33 and W9-8 were also below 10 ug/l (concentrations at these wells detected in May 1999 were 3,420 ug/l and 879 ug/l, respectively). If one-half of the detection limit is used for contouring TCE concentrations, then the "10 ug/l" contour will include W9-33 and W9-8 and the plume will be shown as one continuous plume. Therefore, please revise the Report to show one continuous TCE plume.

    In addition, it appears that the "10 ug/l" contour in Figure 11 should be closed to the north (south of WU4-15) since the concentration detected at WU4-15 is 5.7 ug/l and should not be included in the "between 10 ug/l and 100 ug/l" area. Therefore, please revise the Report to show a closed "10 ug/l" contour to the north.

11. **Figure 18:** The figure shows groundwater contours and estimated capture zones. The capture zones drawn around EA1-1 and EA1-6 appear to be too large. The pump rate at EA1-6 has in the past been approximately 1 gallon per minute (gpm). The pump rate at EA1-1 has been less than 1 gpm. In addition, the contours drawn near these two extraction wells do not indicate that there is much of an effect on groundwater flow around these wells. Therefore, please revise the figure to indicate that the estimated capture zones are smaller than currently depicted around extraction wells EA1-1 and EA1-6.

    Furthermore, the estimated capture zone around EA1-3 is drawn too far to the west. The

groundwater flow contours do not support extending the estimated capture zone that far west. It appears that the capture zone should not include wells W56-1 and W9-1. Please revise the figure to exclude wells W56-1 and W9-1 from the area of the estimated capture zone around EA1-3.

In addition, the estimated capture zone around EA1-5 appears to be drawn too far to the east. The groundwater flow contours do not support extending the estimated capture zone that far. WU4-24 should not be included in the capture zone and the capture zone should join the EA1-2 capture zone near the 16-foot contour. Please revise the figure to indicate a smaller capture zone around EA1-5 to the east.

Lastly, the estimated capture zone around EA1-4 appears to be drawn too wide. EA1-4 has been pumping at less than 2 gpm. The 4-foot contour should not be drawn with such a "peak" towards the south. This contour line takes into account the water level measured at well 90A. However, the water level at well 90A was measured to be 3.01 feet which does not fit into the 4-foot and 5-foot contour intervals as currently drawn. Therefore, the water level measured at well 90A should not be used for contouring. Eliminating this water level measurement will have an effect on the 4-foot contour. The 4-foot contour will not "peak" towards the south any more. Redrawing the 4-foot contour will have an effect on the estimated capture zone. The capture zone will be narrower. Therefore, please revise the figure to redraw the 4-foot groundwater contour line and the size of the estimated capture zone around EA1-4.

12. **Figure 19:** The -3-foot contour is not adequately drawn in the vicinity of well WSW-6 (there are actually two -3-foot contour lines shown). The -3-foot contour should be drawn more realistically (and due to the lack of data) as a smooth curving line from the area near well W3-11 to WU5-23. Please revise the Report to more adequately depict the location of the -3-foot contour.

In addition, the contours shown in the figure do not appear to be affected by the presence of the extraction wells, with the exception of contours near EXW-1. It is extremely difficult to estimate capture zones if the groundwater contours are not or only slightly affected. It appears that if the groundwater contours are not affected, capture zones are small. However, the capture zones depicted on the figure show a large area of influence. The Report should be revised to indicate substantially smaller capture zones since groundwater contours are not or only slightly affected (except for contours and the capture zone around EXW-1). The capture zone to the east of EXW-1 is drawn too large and should not include W7-13.

Furthermore, although, due to well efficiency considerations, the water level measured at an extraction well does not accurately reflect the water table in the surrounding aquifer, it should be indicated on the figure that the groundwater table around an extraction well is lowered. Therefore, please add circular contours around all extraction wells where the groundwater surface at the extraction well is lowered to below the depicted contour interval (i.e., EXW-5, -4, -3, -2, and -1).

13. **Figure 21:** The TCE concentration contour that is added to this figure as a green line does not reflect the TCE concentration contour depicted in Figure 11. Please revise the Report to add the correct TCE concentration contours to Figure 21.

In addition, as indicated in the figure, none of the four water level measurements around well REG-10B1 were used for contouring, but a capture zone around REG-10B1 was drawn. For clarity, please explain why water levels for wells REG-10B1, 78B1, 111B1, and 77B1 were not used for contouring since, with the exception of the water level measured at 77B1, the measurements appear to be realistic relative to each other. In addition, since none of the water level measurements were used for contouring, please delete the estimated capture zone drawn around REG-10B1 since it is not based on any data. Alternately, please use the data from wells REG-10B1, 78B1, and 111B1 and keep the estimated capture zone drawing.

Furthermore, it is almost impossible to draw a capture zone around REG-5B1 since the groundwater contours are not affected by this extraction well. However, if a capture zone is to be drawn, it should be shown as being perpendicular to the groundwater contours, which would indicate a different orientation of the capture zone than currently depicted in the figure (i.e., the orientation is more to the west southwest).

The capture zones shown in the figure have not been drawn following standard capture zone determination methods which include drawing capture zones perpendicular to groundwater contours. Especially the capture zones drawn for wells REG-8B1 and REG-6B1and parts of the capture zones drawn around REG-7B1 and EA2-2 do not follow the procedure for capture zone determination. Please revise the figure to include a better capture zone estimation for these wells.

MINOR COMMENTS

1. **Table 10:** Footnote "a" in this table references Section 5.3.2.2. However, the correct reference is Section 5.3.1.1. Please revise the Report to provide the correct reference in footnote "a".

2. **Figure 22:** The figure shows the -3-foot contour as being perpendicular to the -2-foot contour. Since groundwater flow in this direction is highly unlikely, please revise the location of the -3-foot contour in Figure 22.

3. **Appendix A:** The figures in the appendix do not have grid lines (like they did in the May 1999 Draft Quarterly Monitoring Report) which would facilitate the review of the figures. For ease of review, please revise the figures to include grid lines.