

COMMENTS ON DRAFT ADDITIONAL SITES INVESTIGATION  
PHASE II REPORT, MOFFETT FEDERAL AIRFIELD BY  
CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCE CONTROL AND  
REGIONAL WATER QUALITY CONTROL BOARD

Comments by Joseph Chou, Dated June 22, 1995

**Comment No. 1:** Page 11, Section 1.5.4. It is correct that soil and groundwater cleanup levels at the petroleum sites does not include polynuclear aromatic hydrocarbons (PAHs). However, should PAHs be found through future confirmation analysis, the Navy will cleanup the contaminated soils to EPA PRGs accordingly.

**Response:** Comment noted.

**Comment No. 2:** Page 56, Section 5.1. Please note that the Petroleum Cleanup Levels at MFA was negotiated between the DTSC, RWQCB and the Navy. In DTSC's letter dated July 6, 1994, it was clearly stated that the soil cleanup levels at the petroleum sites must be based upon fuel constituents of concern and are intended to be protective to water quality. Cleanup levels based on total petroleum hydrocarbon (TPH) are not acceptable to DTSC. In the same letter, DTSC also addressed "Since benzo(a)pyrene has not been detected in other petroleum sites, the DTSC agreed with the Navy not to include PAHs in the current Moffett Field petroleum sites soil cleanup goals. The decision is based on the site specific information provided by the Navy, and is not contradictory with DTSC's policy of setting risk-based individual constituent cleanup goals. This management decision shall not be applied to other federal facilities".

**Response:** All parties involved in establishing soil and groundwater cleanup levels for petroleum-related constituents at Moffett Field have been identified in Section 1.5.4 and Section 5.1. All additional portions of this comment are noted.

**Comment No. 3:** Page 59, Section 5.3. Please note that CIWMB has determined that the Golf Course Landfill meet the definition of a solid waste disposal site pursuant to PRC 40122 and have not closed pursuant to the definition 14 CCR 18011, and therefore meet the scope and applicability of closure and postclosure standards in 14 CCR.

**Response:** Comment noted.

8/21/95

**RESPONSES TO U.S. ENVIRONMENTAL PROTECTION AGENCY'S COMMENTS ON THE  
DRAFT ADDITIONAL SITES INVESTIGATION (ASI) PHASE II REPORT  
MOFFETT FEDERAL AIRFIELD**

Comments by Michael D. Gill, Remedial Project Manager, dated June 21, 1995

**GENERAL COMMENTS**

**Comment No. 1:**                    **The Additional Sites Investigation (ASI) was successful in meeting the project objectives. The report is well organized, and the conclusions reached are generally well presented.**

Response:                            Comment noted.

**Comment No. 2:**                    **The former source area at the Zook Road Spill Site, which is depicted on the figures included in the report, is not addressed in the text or by the investigations performed.**

Response:                            The rationale for selection of soil sampling locations at the Zook Road Fuel Spill Site during Phase I of the Additional Sites Investigation was developed based on information and recommendations contained in the 1988 letter from IT Corporation to the Navy. This letter, in which IT proposed the investigations at the three additional sites, was included as Appendix A in both the (Phase I) Additional Sites Final Work Plan (PRC and JMM 1992a) and the (Phase I) Additional Sites Investigation Report, Draft Final (PRC and JMM 1992b), and has been included as an attachment to these responses. The letter described the occurrences of spilled fuel that was released in a tank area south of the Bravo Taxiway, collecting in low areas along Zook Road north of Bravo Taxiway. The IT letter did not report that the spilled fuel ponded in the suspected locations of the tanks, apparently indicating that any spillage in the tank area was regarded as less of a concern than the area of surface fuel collection north of Bravo Taxiway along Zook Road. The letter proposed subsurface investigations in the area north of Bravo Taxiway only. There are no written records or aerial photographs of the former tanks, and their exact location is uncertain. The Phase I investigation was conducted per the approved work plan in the area proposed in the IT letter and the Phase II investigation was conducted per the approved work plan to further define the extent of contamination found during the Phase I investigation.

**Comment No. 3:**                    **The extent of groundwater contamination at the Zook Road Spill Site has not been determined. The wells appear to be within the area of groundwater contamination and downgradient of the suspected source area. The site requires establishment of a "background" well upgradient of the source area and additional downgradient characterization.**

Response:

Analytical results are available for two of the quarterly sampling events that have followed the August-September 1994 sampling event described in the subject report. Concentrations of petroleum hydrocarbon constituents detected in groundwater samples collected from August 1994 through February 1995 at Zook Road exhibit a decreasing trend for monitoring wells WZR-1 and WZR-2 (no petroleum hydrocarbons have been detected in groundwater sampled from WZR-3):

<u>Well</u>	<u>Compound</u>	<u>Concentration (<math>\mu\text{g/L}</math>), Qualifier</u>		
		<u>Aug. 1994</u>	<u>Nov. 1994</u>	<u>Feb. 1995</u>
WZR-1	TPH-Other Light Petrol.	630 Z	440 Y	370 Z
	Benzene	1 J	1 J	0.5 J
WZR-2	TPH- Other Light Petrol.	76 Z	100 Y	51 Z
	TPH- Other Heavy Petrol.	220 Z	50 U	50 U
	TPH- Diesel	1500 J	50 U	50 U
	Benzene	0.4 J	0.5 U	0.4 J

Please note that with the exception of the anomalous diesel result for WZR-2 in August 1994, all detections of TPH are qualified with a "Y" or "Z", indicating that the fuel pattern on the chromatogram does not match a typical fuel pattern, probably indicating highly weathered fuel.

WZR-1 represents the upgradient well at the site; the next closest well upgradient of the site is found at the NASA Fuel Farm approximately 530 feet south of WZR-1. WZR-1 does not define the furthest upgradient extent of hydrocarbons in groundwater at the site; however, only low levels of TPH, quantified as other light petroleum hydrocarbons and benzene have been detected in groundwater sampled from the well, the constituent concentrations exhibit a diminishing trend, and the fuel appears to be highly weathered. For downgradient well WZR-2, the February 1995 result for other light petroleum hydrocarbons, 51 Z  $\mu\text{g/L}$ , is only slightly greater than both the method detection limit and cleanup level of 50  $\mu\text{g/L}$  (the cleanup level was established for gasoline and not TPH, quantified as other light petroleum hydrocarbons). As with groundwater collected at WZR-1, groundwater collected at WZR-2 indicates a highly weathered fuel. Because of the decreasing trend in hydrocarbon concentrations and the poor chromatographic match between the samples and fuels, the Navy believes that installing additional monitoring wells at Zook Road is not warranted at this time. The Navy will continue to monitor wells WZR-1 through WZR-3 and report trends in hydrocarbon concentrations in groundwater at the site. The Navy will re-evaluate the need for additional wells if hydrocarbon concentrations exhibit increasing trends or if fuel patterns matching those detected in soil at the site are observed in the groundwater.

**Comment No. 4:** Although not a specific project objective, the metals results for soil are not fully presented in the report. In addition, the metals results should be compared individually to background concentrations and standards to identify if specific metals may present a risk to human health and the environment. The extent of metals contamination should then be presented graphically. This is a helpful step when trying to conclude the origin of the metals; naturally occurring or anthropogenic.

**Response:** Results of metals analyses for soils collected at the additional sites will be compared with the established Moffett-area background values for metals and the upper station-wide range of metals values. The risks to human health will be further addressed in the Human Health Risk Assessment contained in the Draft Final Station-Wide Remedial Investigation (to be submitted to the agencies in September 1995). The risks to the environment will be further addressed in the Draft Phase II Site-Wide Ecological Assessment (SWEA) (to be submitted to the agencies in October 1995). The extent of metals identified as compounds of potential ecological concern will be presented graphically in the Phase II SWEA.

**Comment No. 5:** Much of the data presented in this report is unvalidated. Data needs to be validated data before the report is finalized.

**Response:** All laboratory results have been validated. The validation results column included in Appendix C (groundwater) and Appendix D (soil) only show validated data that has been changed by the validation company. Blank spaces in the validation results column indicate that the original laboratory result was unchanged by the validators.

**Comment No. 6:** Please use double-sided copies whenever possible.

**Response:** Comment noted; the draft final report will feature double-sided text and tables.

#### **SPECIFIC COMMENTS**

**Comment No. 7:** Section 2.4.1, page 15, first paragraph, third sentence. The purpose for drilling the nine reconnaissance borings at the Zook Road Fuel Spill Area should be more completely explained. The rationale for installing two sets of borings at the same locations should be presented.

**Response:** Section 2.4.1.1 has been rewritten in order to better describe the rationale for the collocated reconnaissance and sample collection borings at the Zook Road Fuel Spill Site.

**Comment No. 8:** Section 2.4.2, page 17, first paragraph, first sentence. This sentence refers to the depictions of soil borings SBPR-4 through

**SBPR-6 on Figure 4. These borings are not depicted on Figure 4 and are depicted on Figure 10. The text should be changed to reflect this.**

**Response:** Identifications and locations for Patrol Road Ditch soil borings SBPR-4 through SBPR-6 have been added to Figure 4.

**Comment No. 9:** Section 3.1.3.2, page 27, first paragraph, fourth sentence. This sentence states that metals "in soils at Zook Road will be further addressed in the Station-Wide RI." Examination of the station-wide RI reveals that the occurrence of metals at the Zook Road Spill Fuel Spill Site is not addressed. This inconsistency should be explained. In addition, see general comment no. 4.

**Response:** Please refer to the response to General Comment 4.

**Comment No. 10:** Section 3.1.4.2, page 28. Please provide the source of the background data presented in the text. Is background considered naturally occurring or anthropogenic? The last sentence of this section states "No other groundwater results were more than five times greater than the background concentration." Is this limit of five times the background concentration considered an important criteria? Please provide a reference.

**Response:**

- a) The background data for metals in groundwater is provided in the OU5 Feasibility Study (PRC 1995). This document was referenced in Section 3.0 of the Phase II Draft Report as the source for background levels for metals in the groundwater. A reference to the OU5 Feasibility Study will be provided in each section that cites the background levels for metals in groundwater. The background values for metals developed in the OU5 FS were intended to represent naturally occurring metals.
- b) The value of "five times greater than the background concentrations" was an arbitrary level provided for the purpose of general comparison. The reference will be removed from the text of the report.

**Comment No. 11:** Section 3.3.2., pages 32 through 33. Since MFA is in close proximity to San Francisco Bay and other surface water features, it may be possible that tidal fluctuations have some effect on groundwater flow. There is no mention throughout this section of whether or not tidal effects on groundwater flow are important at MFA, or whether any investigations have been completed to assess this. Section 3.3.3 should contain a reference as to whether tidal fluctuations are an important factor; if so, the magnitude of the effect, and if not, the investigations conducted or the rationale for eliminating tidal influence as a factor in evaluating groundwater flow.

Response: The influence of tides on the North Base Area (the northwest corner of the base) is discussed in the North Base Area Hydrogeologic Investigation Report, Draft Final (PRC and JMM 1992c). This study determined that tidal variations do not affect groundwater flow direction or velocity (p. 40). Because they are a similar distance from the San Francisco Bay, it should be assumed that the tidal influence in the North Base Area is similar to those in the area of the Golf Course Landfill 2. Please note that the Cargill Evaporation Ponds, which are not directly connected to San Francisco Bay, serve as a constant-head boundary north of the base and act as a buffer between the bay and the aquifers in the vicinity of the Golf Course Landfill 2. A reference to the above-referenced report will be provided in Section 3.3.2.1 of the report.

**Comment No. 12:** Section 3.3.2.2, page 35, third paragraph, first sentence. The assumed porosity of the subsurface material is presented; however, the porosity value was not used in the calculation of groundwater velocity. Please provide the rationale for presenting an assumed value which is not used.

Response: This oversight will be corrected in the report by including porosity in the calculation of groundwater velocity. The revised velocity will be  $1.3 \times 10^{-5}$ , or 6 inches per day.

**Comment No. 13:** Section 3.3.3.2, page 38, first paragraph, fifth sentence. This sentence explains the source of metals detected in soil samples as being the extraction conducted during sample digestion. This statement should be further explained and supported. Do the results of the field or laboratory quality assurance (QA) samples results support this statement?

Response: The intent of this section was to present the likelihood that metal debris observed in the soil samples were digested during sample extraction, along with the metals (natural or otherwise) sorbed onto the soil. The laboratory was not instructed to remove observable metal debris, and the acid digestion process does not discriminate between metal objects and metals bound in the soil. QC procedures performed both in the field and in the lab cannot determine the proportion of the two sources of metals in the landfill soil, or to what degree the metal debris was digested during sample preparation. The presence of metal debris can at least partially explain the higher concentrations of such metals as cadmium, copper, iron, silver, and zinc (to name a few) in landfill soils compared to landfill perimeter soils. This portion of the report will be modified to better state the point of discussion.

**Comment No. 14:** Section 3.3.4.1, page 39, first paragraph. Analysis of the Hydropunch samples for Total Petroleum Hydrocarbons (TPH) purgeable and extractable would have provided useful data on the extent of groundwater contamination at Golf Course Landfill 2.

**Why were these Hydropunch samples not analyzed for TPH? Any future sampling conducted in this area should be analyzed for TPH.**

Response:

TPH analysis was not included in the HydroPunch sampling because the volume required for analysis, 2 liters, is often greater than the volume that can be efficiently produced by a HydroPunch point. The Phase II work plan, as approved, proposed VOC analysis only because of the small required sample volume of 80 ml. Because VOCs migrate faster through the subsurface than TPH, it was also thought that the VOCs would be a better indicator of whether leachate from the landfill had impacted the A2-aquifer zone. Metals analysis was later added because of its relatively low required sample volume of 1 liter. (Please note that no metals were collected from HPGC2-6 because of low water production.)

**Comment No. 15:**

**Section 3.3.4.1, page 39, third paragraph, fifth sentence. The statement "Results of Hydropunch sampling are probably indicative of localized natural conditions because the relative amplitude of sample results compared to the background levels is evident for all metals..." requires further explanation. The relative amplitude of the results has not been discussed in the text, nor has use of this rationale to establish background conditions been referenced.**

Response:

This description was intended to illustrate that anthropogenic sources are not likely to be the cause of elevated concentrations of metals in the HydroPunch samples collected from the A2-aquifer zone in comparison to background levels established in the OU5 Feasibility Study. Metals concentrations are assumed due to natural conditions because a probable source does not exist. Nearly all metals results for the A2-aquifer zone HydroPunch samples are greater than those for both the landfill and the landfill perimeter wells. For this reason the Navy does not consider the landfill a source for the metals found in the A2-aquifer zone. The term "amplitude" will be replaced with the word "concentration" and the paragraph restructured to provide a clearer comparison of metals analysis results between the A2-aquifer zone and the A1-aquifer zone, perched landfill aquifer, and the established background levels.

**Comment No. 16:**

**Section 5.3, page 58, second paragraph, first sentence. This sentence makes reference to Hydropunch samples collected from the A1-aquifer zone. Section 3.3.4 (p. 38) states that the Hydropunch samples along the north side of the landfill were collected from the A2-aquifer zone. This inconsistency should be explained.**

Response:

All HydroPunch samples were collected from the A2-aquifer zone. This portion of the text will be corrected.

**Comment No. 17:** **Figures 3, 10, and 11. It is unclear why no soil samples have been collected at the suspected source of the fuel spill. Has this area been investigated and remediated previously? If so, this should be reported. If not, a source characterization should be conducted.**

**Response:** Please refer to the response to General Comment 2.

**Comment No. 18:** **Figure 11. See comment No. 3.**

**Response:** Please refer to the response to General Comment 3.

**Comment No. 19:** **Figure 17. The depth of sample collection should be referenced on the figure.**

**Response:** Sample depths have been added to the chemical data boxes in Figure 17.

**Comment No. 20:** **Figure 18. The vertical extent of groundwater contamination has not been established beneath the landfill. At least one permanent A2-aquifer zone monitoring well should be installed at this site to confirm the HydroPunch results, and to establish a long-term monitoring point for Golf Course Landfill 2 in the A2-aquifer zone.**

**Response:** Because the three downgradient monitoring wells were installed in the A1-aquifer zone, it was decided in the field to collect HydroPunch samples from the A2-aquifer zone in order to determine whether this zone was impacted by leachate in the landfill. The results of HydroPunch sampling would then be used to determine the need for installing A2-aquifer zone wells. Because the results of HydroPunch sampling and perimeter well sampling have not indicated that either the A1- or A2-aquifer zones have been impacted by the landfill leachate, the Navy believes that an additional well in the A2-aquifer zone is not warranted.

**Comment No. 21:** **Tables 6, 10, 13 and 14. The actual sample results for metals should be included on the report. In addition, a comparison to background levels or standards (such as CERCLA Region 9 PRGs) would also be helpful.**

**Response:** a) Sample results for metals were summarized in Tables 6,10,13, and 14 because the presentation of all results would be cumbersome. Nearly all of the results for metals are greater than the detection limit. Because of this, scanning a table containing all metals results for notable concentrations or trends would be difficult. In contrast, with organic constituents, detectable results are the exception rather than the rule, and a full presentation of all the data (with highlighting of detected results) can be useful

(see Table 12). The results of metals in soil samples can be found in table format in Appendix D, Table D-4.1.

- b) Tables 6, 10, 13, and 14 compare the ranges of metals results with the established Moffett-area background values.

**Comment No. 22:**

**Table 15. The depth of sample collection should be included on this table.**

Response:

The HydroPunch sampling depths have been added to Table 15.

**Comment No. 23:**

**Plate 1. The data presented on this plate should include data collected during Phase I.**

Response:

Phase I sample data for boreholes that were sampled and logged, SBZR-2A, SBZR-2B, and SBZR-2D, are now presented in Plate 1.

## REFERENCES

- PRC. 1995. Draft Final Operable Unit 5 Feasibility Study Report, Moffett Federal Airfield, California. January.
- PRC and JMM. 1992a. Naval Air Station Moffett Field, Additional Sites Final Work Plan, San Francisco, California. April.
- PRC and JMM. 1992b. Naval Air Station Moffett Field, Mountain View, California, Additional Sites Investigation Report, Draft Final. December.
- PRC and JMM. 1992c. Naval Air Station Moffett Field, Mountain View, California, North Base Area Hydrogeologic Investigation Report, Draft Final. October.