



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

January 29, 1993

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 has reviewed the Draft Additional Tank and Sump Field Investigation Technical Memorandum. Comments provided by our representative, SAIC, Inc., are enclosed. Please call me at (415) 744-2385, or Mike Gill at (415) 744-2383, if you have any questions.

Sincerely,

A handwritten signature in black ink that reads "Roberta Blank".

Roberta Blank
Remedial Project Manager

cc: Elizabeth Adams, RWQCB
Cyrus Shabahari, DTSC



Science Applications International Corporation
An Employee-Owned Company

Technology Services Company

January 13, 1993

DCN: TZ4-C09015-RN-M15818

Ms. Roberta Blank (H-9-2)
U.S. Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, CA 94105

Ref: EPA Contract No. 68-W9-0008; Work Assignment No. C09015
SAIC/TSC Project No. 06-0794-03-0630
Draft Additional Tank and Sump Field Investigation Technical Memorandum

Dear Roberta:

SAIC/TSC has completed its technical review of the referenced document. The review was performed by Mary Wesling, SAIC/TSC Geologist.

Several objectives of the investigation, as stated in the Additional Tank and Sump Field Work Plan (Work Plan, PRC, April 9, 1992) were not completed. These deficiencies are among the major concerns addressed in this review and are described below:

- The Work Plan stated that soil sampling would continue laterally away from the former excavation site of Tank 53, until field screening of samples indicated that levels of total petroleum hydrocarbons as gasoline (TPHg) and benzene, toluene, ethylbenzenes and xylene (BTEX) contamination were lower than State Water Resources Control Board (SWRCB, 1989) action levels (TPH purgeable as gasoline = 10 mg/kg). As discussed further in the following review, this objective was not accomplished.
- Geoprobe[®] field screening of soil samples from the south-southeast at the former Tank 53 excavation site showed high TPHg and BTEX contamination in that area. These results were available to PRC on May 20, 1992, one week prior to drilling and installation of monitoring well W53-2(A1). Based on the results of the field screening and the characteristics typical of hydrocarbon plume migration, a well would have been more advantageously placed to the south-southeast of the former tank location in the area of highest soil contamination.
- Appendices A and B indicate that the analytical results presented were "not reviewed." Laboratory data sheets were not provided as part of the report. This documentation should be included in future reports.

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SAIC

- Based on the analytical data PRC presented for soil, groundwater and grab samples from Sump 91, significant concentrations of several volatile organic compounds (VOCs) were detected in all three mediums. Particularly, a total 1,2-DCE concentration of 2,400 µg/L was found in the grab sample from the sump contents. PRC's conclusion that Sump 91 is not a VOC contaminant source is not supported by the analytical results.

Additional concerns are presented in the text of the enclosed review. If you have any questions, please call me at (415) 399-0140.

Sincerely,

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
Technology Services Company



Fred Molloy
SAIC/TSC Work Assignment Manager

FM

Enclosure

DCN: TZ4-C09015-RN-M15818

TECHNICAL REVIEW OF
DRAFT ADDITIONAL TANK AND SUMP
FIELD INVESTIGATION
TECHNICAL MEMORANDUM
NAVAL AIR STATION, MOFFETT FIELD
MOUNTAIN VIEW, CALIFORNIA

JANUARY 1992

SUBMITTED TO:

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 HAWTHORNE STREET
SAN FRANCISCO, CALIFORNIA 94105

SUBMITTED BY:

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EPA CONTRACT NO. 68-W9-0008
EPA WORK ASSIGNMENT NO. C09015
SAIC/TSC PROJECT NO. 06-0794-03-0630

TECHNICAL REVIEW OF
DRAFT ADDITIONAL TANK AND SUMP
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GENERAL COMMENTS

1. Verification documentation for analytical data is not presented for review in this report. This documentation should include the laboratory's analytical data sheets, with detection limits listed for each analyte, and laboratory quality assurance/quality control (QA/QC) documentation sheets. Appendices A and B of the report indicate that the analytical results presented in the summary tables have not been reviewed. Future reports should include appendices containing laboratory analytical sheets and QA/QC documentation.
2. Generally, the investigative methods described in the work plan (PRC, 1992) were followed, objectives were met, and deviations were explained. One notable exception is detailed in this review under Specific Comment No. 3.
3. PRC concludes that Sump 91 is not considered a VOC contaminant source. The lithological and analytical data presented for soil, sump grab sample, and groundwater do not support this conclusion. (See Specific Comment No. 4).

SPECIFIC COMMENTS

1. Section 3.2.3, page 13, paragraph 3

The work plan states that because the downgradient direction is not well defined in the A1 zone near Tank 53, the field screening of Geoprobe[®] groundwater samples could be used to more accurately position well W53-2(A1). This approach was not used due to access restrictions; however,

Geoprobe® field screening of soil samples south-southeast of the former site of Tank 53 excavation (tank site) showed TPHg and BTEX contamination in that area, probably due to surface topography sloping toward a stormwater drain. The results of the field screening and additional laboratory analyses indicate the likelihood of migration of TPHg and BTEX into the A1 zone in the area of the highest soil contamination to the south-southeast, rather than to the northwest of the former tank site. The results of the Geoprobe® field screening were available to PRC on May 20, 1992, one week prior to drilling and installation of monitoring well W53-2(A1). Based on the results of the field screening and the characteristics typical of hydrocarbon plume migration, a well would have been more advantageously placed to the south-southeast of the former tank site in the area of the highest contaminant concentrations of TPHg and BTEX.

Additionally, in an area of very shallow groundwater (5 feet below land surface [BLS]), a stream or ditch channel might be likely to act as a hydraulic barrier to a plume of hydrocarbon which typically will float on top of the water table. Well W53-2(A1), placed on the opposite side of the Marriage Road ditch from the Tank 53 site, would be unlikely to intercept a hydrocarbon plume originating at Tank 53. The work plan did not state that well placement would be on the opposite side of the Marriage Road ditch from the former excavation, nor was it indicated in Figure 4 of the work plan. The presence of a petroleum hydrocarbon plume in the area of the former tank site has neither been proven nor disproved by this investigation.

2. Section 3.4.1, Page 19, Paragraph 2

PRC stated that the 24 soil samples collected from the Tank 53 area were collected from 4.5 to 5.5 feet BLS. Two of the samples, both from T53-23, were retrieved at 2.0-3.0 and 3.5-4.5 feet BLS. PRC's statement should be changed to correctly represent the verified contaminant profile.

3. Section 4.3.2, page 29, paragraph 5

The work plan (section 5.2.1, page 14) stated that soil sampling would continue laterally away from the former tank site until field screening of samples indicated levels of total petroleum hydrocarbons as gasoline (TPHg) and benzene, toluene, ethylbenzenes and xylene (BTEX) contamination were lower than State Water Resources Control Board's (SWRCB) action levels (TPH purgeable as gasoline - 10 mg/kg). As reported in sections 4.3.2 and 5.0, as well as Tables 10 and 11, and illustrated in Figures 3 and 7, field screening of samples to define the lateral extent of contamination was not continued to the south and southeast of T53-18, 19, 20, 22 and 23. All of these field screening locations were well above the action level for TPHg and in many instances were above action levels for the BTEX constituents.

Collection of further data as to the lateral and vertical extent of soil contamination at the former tank site will be necessary in order to determine appropriate remedial options as stated by PRC. Based on the elevated concentrations of TPHg and BTEX south-southeast of the former excavation, further sampling should be performed in this area.

4. Section 5.4, page 36, paragraph 2

The boring log for SBS91-001 (W91-1[A1]) indicates a change in lithology at a depth of 15 feet BLS from a nonplastic clayey silt (ML) to a moderately plastic silty clay (CL). The presence of this CL unit from 15 to 17.3 feet BLS would retard downward migration of VOCs, causing a higher concentration of the contaminants in the sample retrieved at 15 feet BLS compared with the sample from 20 feet BLS. It would also be anticipated that VOC concentrations in shallower soil samples would be lower than the concentrations found in the 15 feet BLS sample, due to the volatile characteristic of VOCs. This is reflected in the analytical data for SBS91-001.

The highest concentrations of total 1,2-DCE, 1,1-DCE and TCE detected in the analysis of soil samples from SBS91-001 are apparently adsorbed to the clayey layer described above. Since these concentrations are basically within the saturated zone, the following relationship should apply:

$$K_d = \frac{C_{soil}}{C_{water}}$$

- where C_{soil} - concentration adsorbed to soil ($\mu\text{g/L}$),
 K_d - soil-groundwater equilibrium partitioning coefficient (mL/g), and
 C_{water} - dissolved concentration in groundwater.

- Furthermore, $K_d = (K_{oc})(f_{oc})$,
 where K_{oc} - water/organic carbon partitioning coefficient (mL/g), and
 f_{oc} - fraction of organic carbon on soils (no units).

By taking f_{oc} and K_{oc} values that were used in the Draft Operable Unit 2 Report, estimated concentrations in groundwater for these VOCs (1,1-DCE, 1,2-DCE, and TCE) were calculated by the reviewer (see Table below). For 1,2-DCE and TCE these calculated quantities are much greater than the respective maximum contaminant level (MCL) for water; therefore, the reviewer believes that Sump 91 should be further investigated as part of the OU2 soils at NAS Moffett.

EQUILIBRIUM CONCENTRATIONS - SUMP 91					
CONSTITUENT	K_d (mL/kg)	C_{soil} ($\mu\text{g/kg}$)	Calculated 1 C_{water} ($\mu\text{g/L}$)	EPA MCL water ($\mu\text{g/L}$)	STATE MCL water ($\mu\text{g/L}$)
1,1-DCE	0.65	4	6	7	6
1,2-DCE	0.35	88	250	70	6
TCE	1.27	550	433	5	5

The analytical results from the sump grab sample showed a concentration of 2,400 µg/L of total 1,2-DCE and of 120 µg/L of trichloroethene (TCE). The high concentrations of 1,2-DCE and TCE in the sump grab sample conflict with PRC's conclusion that Sump 91 should not be considered a VOC contaminant source.

Based on the elevated detection limits in the grab sample analysis, the presence of other VOCs, such as tetrachloroethene (PCE), cannot be discounted.

5. Section 5.4, page 36, paragraph 3

From the reviewer's personal knowledge, the Navy has historically used waste oil to fuel boilers. PRC concludes that TPH extractable components detected in the grab sample from Sump 91 and the groundwater sample from well W91-1(A1) may be the result of boiler use in Building 88. Waste oil typically contains some fraction of waste solvents. PRC has not considered this possibility in concluding that Sump 91 should not be considered a VOC contaminant source. Since the same TPH extractable component has been detected in both the sump grab sample and the groundwater sample in the downgradient well (W91-1[A1]), clear evidence exists that contaminants have migrated from Sump 91 to the subsurface.

REFERENCES

IT Corporation, 1992. Remedial Investigation Report Operable Unit 2: Sites 3-11, 14, 16-19, Soils, NAS Moffett Field, California, August 1992.

PRC, 1992. Naval Air Station Moffett Field Mountain View California, Additional Tank and Sump Investigation Field Work Plan, April 9, 1992.

SWRCB, 1989. Leaking Underground Fuel Tank Field Manual: Guidelines for Site Assessment, Cleanup, and Underground Storage Tank Closure. State of California, State Water Resources Control Board, October 1989.