STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION
1111 JACKSON STREET, ROOM 6040
OAKLAND 94607

Phone: Area Code 415
464-1255

January 26, 1988

File No. 2189.8009(TJB)

C. T. Moyer, III
Captain, U.S. Navy
Naval Air Station Moffett Field
Moffett Field, CA 94035

Subject: SAMPLING AND ANALYSIS PLAN, SOLID WASTE ASSESSMENT TEST WORK PLAN, QUALITY ASSURANCE PROJECT PLAN, AND HEALTH AND SAFETY PLAN FOR MOFFETT FIELD NAVAL AIR STATION

Dear Captain Moyer,

We have reviewed the Sampling and Analysis Plan (SAP), Solid Waste Assessment Test Workplan (SWAT), Quality Assurance Project Plan (QAPP), and Health and Safety Plan prepared by IT Corporation dated December 1987. The Sampling and Analysis Plan and the Quality Assurance Project Plan were also reviewed by the Environmental Protection Agency (EPA), the National Oceanic and Atmospheric Administration (NOAA), and the Fish and Wildlife Service. Comments from these three agencies were provided to Naval Facilities Engineering Command staff on January 14, 1988.

In general, we were pleased to see a much more comprehensive approach being taken to the complex array of problems encountered at Moffett Field. Though a number of improvements need to be made to the subject documents, we believe these can be addressed in a straightforward and expeditious manner.

The Regional Board staff's comments regarding the above plans are contained in the following attachments:

Attachment 1 - Sampling and Analysis Plan
Attachment 2 - Solid Waste Assessment Test
Attachment 3 - Quality Assurance Project Plan

We have no comments regarding the Health and Safety Plan.

The Work Plan has not been completely reviewed by Regional Board or EPA staff; however, field work may commence prior to approval of the Work Plan provided the SAP, SWAT, and QAPP are approved. Once the Work Plan is approved, it will be attached to the Interagency Agreement (IAG) between the Navy, EPA and the State.

Pursuant to Section 13267 of the California Water Code, we request that you submit by February 19, 1988, a revised SAP, SWAT, and QAPP which address the comments contained in the attachments, as well as the comments previously provided by EPA, NOAA, and the Fish and Wildlife Service

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If you have any questions regarding the attached comments, please contact Tom Berkins of my staff at (415) 464-1249.

Sincerely,

Stephen I. Morse, Chief
South Bay Division

Attachments

cc: Sharon Christopherson, NOAA
Lee Esquibel, SCCHD
Terry Grummitt, IT Corp.
Ensign John Heckmann, Moffett Field
Tom Iwamura, SCVWD
Chloe Jue, NAVFACENGCOM
Chien Kao, DOHS/TSCD
Lewis Mitani, EPA
Don Palawski, Fish & Wildlife Service
Candice Tal, Metcalf & Eddy
Gil Torres, SWRCB

ATTACHMENT 1

SAMPLING AND ANALYSIS PLAN
VOLUME II, DECEMBER 1987
MOFFETT FIELD NAS

1. Section 1.1, Background, Section 1.2, Objectives, and Section 2.0, Description of Sampling Efforts - The current sampling plan has been modified to include the investigations at nine additional sites, including 20 underground tanks and sumps. However, Sections 1.1, 1.2, and 2.0 do not address the other 48 tanks and sumps located on Moffett Field. These sections should clarify how and when the other tanks and sumps will be investigated.

2. Page 1-5, second paragraph - "CM" should be "GM".

3. Page 2-2, first paragraph, last sentence - Clarification is needed regarding which tanks are being discussed.

4. Page 2-2, last paragraph - This paragraph should also briefly discuss soil sampling to be conducted at the other sites.

5. Section 2.3, General Element 3 - This element states that geophysical logging will be performed "in all Phase II wells which penetrate B and/or C aquifers," but no statement is made whether this will also be the case for Phase I wells. Clarification is needed.

6. Page 2-6, General Element 5 - The frequency of water level measurements should be specifically stated.

7. Page 2-6, General Element 6 - No mention is made regarding the MEW wells.

8. Section 2.3 - No mention is made regarding the investigation of private wells.

9. Section 2.4.3 -

   a. First paragraph - If the A aquifer is present at Site 1, i.e. wells W1-6(A) through W1-9(A) are installed in the A aquifer, one monitoring well in the B-1 aquifer will be inadequate to detect migration of leachate at depth. It is recommended to install two downgradient B1 monitoring wells and one upgradient B1 well. In addition, it is also recommended to collect a soil sample immediately above the shallowest aquifer encountered.

   b. Second paragraph - It is recommended to install two additional shallow aquifer wells, located 300 feet apart, between proposed wells W1-7(A) and W1-8(A) on the northern boundary of the landfill. Similar to 9.a above, it is also recommended to collect a soil sample immediately above the shallowest aquifer encountered. In addition, the frequency of water level measurements should be specified.

   c. Third paragraph - It is recommended to install three leachate monitoring wells within the landfill during Phase I to adequately

determine the leachate quality and groundwater gradients. These wells are recommended to be installed during Phase I since the statutory deadline for the SWAT report is July 1, 1988. It would be appropriate to install the "perimeter" monitoring wells after the leachate wells are installed and gradients within the landfill are determined.

It is also recommended to collect a soil sample of the native soils located immediately beneath the refuse when the leachate wells are being installed. In addition, it is suggested to obtain geologic information at three perimeter locations to a depth of 50 - 70 feet prior to installing the perimeter wells.

d. Fourth paragraph - If PCBs are detected in groundwater during the first month of sampling, it will be necessary to include PCB analyses during subsequent sampling.

10. Page 2-11, first paragraph, second sentence - This sentence needs to be re-worded.

11. Section 2.5.3 - It is recommended to conduct additional background investigations to determine the exact location of the golf course landfill prior to commencing the field investigations at this site. It should be noted that the previous borings conducted within the "landfill" boundary were only to a depth of 7 feet, whereas the reported depth of offsite fill above the landfill was reported to be 6 to 8 feet. Thus, the previous borings may have been to shallow.

In regards to the proposed investigation, comment 9, above applies to this site with the exception of 9.b, first sentence.

12. Section 2.6.1, third sentence - Where is the remainder of the runoff diverted? Any other drainage ditches leading to surface waters should be identified and shown on the appropriate maps.

13. Page 2-14, second paragraph - Figure 2-3 shows two wells labeled W3-4(B2).

14. Section 2.6.3 -

a. First paragraph - It should be stated that the reason Tank 53 is being investigated is because previous tank testing conducted indicated a plumbing leak. The location of the surface water and sediment samples should be shown on a map. It is also recommended to collect several sediment samples along the "east-west receptor."

b. Second paragraph - It is recommended to install an A aquifer well on the west side of the ditch in the vicinity of W3-13(B1) and W3-7(B2). There are currently no shallow wells existing or proposed between wells W3-2(A) and W3-19(A), which is a distance of 1500 feet. In addition, it is recommended to collect a soil sample immediately above the shallowest aquifer zone encountered.

c. Third paragraph - If PCBs are detected during the first round of sampling, it will be necessary to include PCB analyses during subsequent sampling.

15. Section 2.7.1, page 2-18, first paragraph - The previous page lists six tanks located in the vicinity of sites 4,6 and 7; however, there is no indication of any investigation at four of the tanks. Clarification is needed.

16. Section 2.7.2 - An additional objective for Sites 4, 6, and 7 should be to define the extent of soil contamination at all three sites.

17. Section 2.7.3. -

a. Second paragraph - Typographical error: W10-15(A) should be W4-15(A). The legend on Figure 2-4 should be modified since it currently lists the wastewater ponds as sumps.

b. Third paragraph - In the previous sampling plan, proposed monitoring wells W4-14(A), W4-15(A), and W4-16(A) were located immediately adjacent to and downgradient of the former ponds, the existing "triangular" pond, and the existing "square" pond, respectively. However, in the current sampling plan these wells appear to be located in less desirable locations. For example, it appears that no monitoring wells are proposed adjacent to the existing "triangular" pond, and well W4-16(A) is proposed to be located further away from the "square" pond.

Currently there are no properly installed existing monitoring wells located upgradient of the former ponds or active ponds, nor are there any proposed in the current sampling plan. In order to properly evaluate the extent of contamination from the ponds, if any, it is essential to have monitoring wells located upgradient and downgradient of the ponds.

c. Third paragraph - If the purpose of proposed well W7-20(A) is to determine the magnitude of pollution from tanks 2 and 54, the well should be located closer to the tanks. A statement should be added noting that the proposed investigations for these tanks are contained in subsequent sections of the sampling plan.

The rationale for the location of wells W4-11(A), W6-8(A), W7-18(A), W7-19(A), and W7-21(A) was not provided. The fourth sentence states that "data from the other three wells will help define the eastern edge of the plume"; however, wells W7-18(A), -19(A), and -21(A) are located either upgradient or on the western edge. Clarification is needed. In addition, Figure 2-4 shows well W7-19(A) to be located between hangars 2 and 3, whereas Figure 3-11 shows the well located at the northeast corner of hangar 3. Clarification is needed.

d. Fourth paragraph - "Borehole soil samples" are proposed to be collected at depths of 3 and 15 feet, whereas the "additional soil samples" will be taken at depths of 5 and 10 feet. It is recommended to collect the soil samples from the same depths for all borings at these sites. Similar to previous comments, it is also

recommended to collect a soil sample in the unsaturated zone immediately above the water table for all the boreholes. In addition, Table 4-1 indicates that soil samples will be collected at depths of 0.2 and 3 feet; however, this is not stated in the text.

18. Section 2.8.1, sixth paragraph - The second sentence states that tanks 30 and 31 were empty, as of June 1, 1986. Are these tanks still empty? Update this paragraph.

19. Section 2.8.2, first paragraph - The stated objective is to "define the extent of contamination that occurred by discharge into the french drains"; however, there is no mention of any investigations for the eleven fuel tanks located at this site. The proposed investigations to determine whether these tanks have leaked should be contained in this report or another referenced report.

20. Section 2.8.3 -

    a. First paragraph - It is recommended to install an A aquifer monitoring well immediately downgradient of the fuel farm during Phase I. A possible alternative would be relocate proposed well W5-12(A) to the north of Tank 13 during Phase I. Since the B1 aquifer has not yet been investigated at Site 5, it is recommended to install a B1 aquifer well north of the fuel farm concurrent or prior to installing proposed well W5-4(B2).

    The locations of the three wells proposed for the southern portion of the fuel farm do not appear to be directly associated with monitoring of potential leakage from any of the four groups of tanks identified (tanks 8/9, 4/6, 5/7, and 18/27). If possible, a preferred alternative would be to install four A aquifer wells during Phase I, locating one downgradient of each of the four groups of tanks.

21. Section 2.8.3, fourth paragraph - It is recommended to collect a soil sample in the unsaturated zone immediately above the water table for all the boreholes.

22. Section 2.9.3. -

    a. First paragraph - The current status of the sump should be provided and the location of the sump and former tank should be identified on Figure 2-5. Figure 2-5 shows proposed well W8-5(A); however, the text does not indicate if or when this well would be installed. If PCBs are detected in first round of sampling, it will be necessary to include PCB analyses during subsequent rounds.

    b. Second paragraph - Soil samples are also recommended to be collected below a depth of one foot (e.g. 3-5 feet) in at least half of the proposed borings. In Table 4-1, Site 8, the number of sample locations and sample depth does not correspond with the text.

23. Section 2.10.1 - The results of the investigations conducted at sump 66 and tanks 67 and 68 should be discussed and the location of the monitoring wells installed during these investigations should be shown

on Figure 2-6.

24. Figure 2-6 - The symbol for wells installed by ESA should be included in the legend. In addition, the figure shows a MEW well designated as 49-2A; however, no such well exists.

25. Section 2.10.3, first paragraph - It appears that well W9-5(B3) was omitted from the first sentence.

26. Page 2-27, third paragraph - It is recommended to collect a soil sample in the unsaturated zone immediately above the water table for all boreholes.

27. Section 2.11.1 -

    a. Second paragraph - Five of the tanks/sumps (#21, 25, 42, 51, and 52) listed are not shown on any map and no investigations are proposed for three of the tanks (#21, 51, and 52). All tanks and sumps should be shown on the appropriate map and the investigation to be conducted at each tank should be discussed or referenced.

    b. Fourth paragraph - The proposed investigation for tanks 19, 20, 66, 67, and 68 (Sections 3.6 and 3.10) should be referenced and the borings and monitoring wells installed during the previous investigations should be shown on the appropriate map.

28. Section 2.11.3 - A soil gas survey will not assist in delineating the extent of BNAs and metals. It is recommended to collect a soil sample in the unsaturated zone immediately above the water table for all boreholes.

29. Section 2.12.1 - Monitoring wells ME-3C and 5C and deep wells 14M1 and 14M2 should be shown on Figure 2-8.

30. Section 2.12.3 -

    a. First paragraph - The third sentence states that "well W7-16(C) is to be located upgradient of the Hangars 2 and 3 source area." However, this proposed location is situated at the corner of Hangar 2 in a former disposal area (see page 2-16). Thus, this well may not represent true upgradient conditions and may be more suitably located further to the south.

    b. Second paragraph - It should be noted that proposed well W9-3(C) is located downgradient of several Moffett source areas.

31. The previous sampling plan contained a section regarding proposed sampling to be conducted of private deep wells; however, this section has been omitted from the current sampling plan. Any sampling to be conducted from deep wells should be discussed in the sampling plan.

32. Section 3.3.3 -

    a. First paragraph - The number of "surface soil samples" should be specified. Based on a previous site visit, it appeared that the

stained area, shown on Figure 3-5, originated at the fence line along the southern boundary of the engine test stand area.

b. Second paragraph - The second sentence states that "an additional sample will be collected below the water table at two of the borings to assess the need for deeper groundwater monitoring." Shallow groundwater samples are recommended prior to assessing the need for deeper samples. Based on the level of pollutants detected from shallow soil samples previously collected by Regional Board staff, and the fact that depth to groundwater is less than five feet, at least two shallow monitoring wells are recommended during Phase I.

c. Third paragraph - Nine surface soil samples are proposed around the perimeter of the test pad and ten are proposed in the stained area; however, Figure 3-5 indicates that 20 surface samples will be collected and Table 4-2 indicates that 37 samples will be collected at depths of 0.5 and 5 feet. Clarification is needed.

It is unclear why analyses for VOCs, BNAs, and PCBs are only proposed for soil samples collected at a depth of ten feet. The "surface and boring" soil samples should also be analyzed for VOCs and BNAs given the fact that "waste oils, hydraulic fluids, and fuels were disposed in this area. If PCBS are suspected to have been disposed in this area, the surface samples should also include analyses for PCBs.

d. Fourth paragraph - If additional soil sampling and monitoring wells are needed upon completion of Phase I, this work should be commenced during Phase II.

33. Section 3.4.3 -

a. Second paragraph - Soil gas sampling is also recommended to be conducted at three additional transects: one located immediately north of the bermed pit, one located south of the bermed pit, and one located north of the fuel storage tank.

b. Fourth paragraph - The first sentence states that nine borings will be placed around the periphery of the pit; however, Figure 3-6 only shows eight.

Soil borings should also be conducted within the bermed pit since the highest levels of pollutants found in soils would be expected beneath the bermed area.

Fourth and sixth paragraph - It is recommended to collect a soil sample in the unsaturated zone immediately above the water table for all boreholes.

Figure 3-6 indicates that one soil boring will be drilled south of the fire fighting fuel storage tank. The investigation to be conducted at the fuel tank should also be discussed in the text. A soil boring is also recommended immediately north of the tank.

c. Fifth paragraph - The first sentence states that two monitoring wells will be placed downgradient from the waste fuel tank; however, it

appears that the locations shown on Figure 3-6 are cross-gradient rather than downgradient. It is recommended to install monitoring wells between the bermed pit and the fuel storage tank since these may be separate source areas.

The last sentence states that sampling of groundwater will be in accordance with Tables 4-3 and 4-5. These two Tables are not consistent with each other. For example, Table 4-3 indicates that metals and BNAs will be collected during the first month only and then quarterly, if warranted. However, Table 4-5 indicates that metals and BNAs will be collected for two monthly sampling events. Clarification is needed.

d. Sixth paragraph - If PCBs and dioxins/furans are detected at the three foot depth samples it will be necessary to analyze the deeper samples for these pollutants also.

34. Section 3.5.1, third paragraph - Additional detail regarding the excavation should be provided. Information to be provided should include: depth of excavation, pollutants detected if sampling was conducted, disposal of the excavated soils, and the location of the excavated area should be shown on Figure 3-7.

35. Section 3.5.1, fourth paragraph - The proposed locations of monitoring wells W5-11(A) and W6-8(A) should be shown on Figure 3-7. Based on Figure 2-4, it appears that the above monitoring wells are located downgradient of Site 13 a distance of 100 feet and 200 feet, respectively.

36. Section 3.5.3, second paragraph - The analyses to be conducted at Site 13 should be shown on Table 4-5.

37. Section 3.5.3, third paragraph - Additional investigations should be conducted in Phase II if the results of Phase I sampling indicate a need to conduct further investigations.

38. Section 3.6.1 - Very little detail is provided regarding the previous investigations conducted at tanks 19, 20, 67 and 68. The same level of detail for background investigation information that was provided for Sites 1 through 10 should also be given here. For example, the levels of pollutants detected in soil and groundwater samples should be provided. In addition, the locations of the soil borings and monitoring wells installed at tanks 19 and 20 should be shown on the appropriate map. It is recommended that tanks 19 and 20 be shown on a separate map with a larger scale, similar to Figure 3-10.

39. Section 3.6.2 - Previous monitoring wells installed by ERM-West at tanks 19 and 20 indicated groundwater pollution resulting from leaks at these tanks. The levels of pollution detected in these wells warrant further groundwater investigations in addition to the proposed soil investigation. Therefore, the objectives of the sampling plan for this site should be similar to the Site 9 objectives.

40. Section 3.6.3 -

a. The analyses to be conducted at Site 14 (all four tanks) should be shown on Table 4-5.

b. First paragraph - Previous soil sampling conducted at tanks 19 and 20 have detected soil pollution. Therefore, additional soil sampling should be conducted to further define the extent of pollution.

c. Second paragraph - As a general rule, after a tank has been excavated, the soil samples should be collected from the side walls and bottom of the excavation, in areas where there are visual signs of pollution. In addition, two soil samples, located one-third equidistant from the end of each tank, are recommended to be collected from the excavation bottom.

41. Section 3.7.2 and Section 3.7.3, first paragraph - The same objectives and sampling plan rationale for Site 16 should apply for Site 15. Specifically, the following actions are recommended at each sump/separator: a) collect and analyze/characterize the waste in each sump/separator, b) empty, clean, and visually inspect each sump/separator for potential leakage, c) install two borings adjacent to each sump/separator (one upgradient and one downgradient), and d) collect soil samples below the bottom of the sump/separator.

Based on the results of the inspection and soil samples, it may be necessary to install monitoring well(s) and conduct further soil sampling during Phase II. If these sumps/separators are scheduled for removal, soil samples should be collected at the base of the excavation.

Table 2-5 and Table 2-2 should read 4-5 and 4-2, respectively.

42. Section 3.8.1, third paragraph - MEW monitoring wells 64A and 48B(1), located upgradient and downgradient of Site 16, have been omitted.

43. Section 3.8.3 -

a. First paragraph - Wastewater samples should be collected from the "catch basins." It is also recommended to pump dry, clean, and visually inspect the catch basins for potential leakage.

b. Second paragraph - An additional soil boring is recommended on the downgradient side of the oil/water separator. If the base of the separator or catch basins are below the water table, a soil sample is still recommended below the bottom elevation of each separator.

c. Third paragraph - "If chemicals of concern are detected in the soil" in Phase I, at least one A aquifer well should be installed downgradient of the source during Phase II. The proposed groundwater sampling for any monitoring wells installed should follow Table 4-3.

d. Fourth paragraph - Same comment as 40.c, above.

44. Section 3.9.3, second paragraph - Same as comments 40.c and 43.c, above.

45. Section 3.10.1, fourth paragraph - The source of the high levels of PCE detected in soil and groundwater is known. The sump reportedly was cracked and PCE is not one of the upgradient pollutants which has migrated onto Moffett Field.

46. Section 3.10.3 -

    a. Same as comment 40.c, above.

    b. Second paragraph - If the intent of the soil gas survey is to delineate the extent of pollution from sump 66, soil gas sampling is also recommended at two additional transects: one located upgradient of the sump and one located further downgradient of the currently proposed transect.

47. Section 3.11.3 -

    a. Second paragraph - Same as comment 40.c, above.

    b. Third paragraph - It is recommended to collect a soil sample in the unsaturated zone immediately above the water table for all boreholes.

    c. Fourth paragraph - A minimum of two B1 aquifer wells are recommended to be installed downgradient of tank 43. The levels of pollutants found in the shallow groundwater adjacent to the tank are very high; however, there are no existing properly installed B1 wells or proposed B1 wells downgradient of the tank a distance of over 1200 feet. These wells would also be useful for the proposed B1 aquifer test at this site.

    d. Fifth paragraph - The proposed groundwater sampling for any wells installed should follow Table 4-3. Table 4-5, Site 19, well W19-2(B2) shouold read W19-2(B1).

48. Section 3.11.6 -

    a. First paragraph - Same as comment 40.c, above.

    b. Second paragraph - Although the tank removal and soil treatment/ disposal procedures are under a different Navy contract, the procedures still need to be provided to the regulatory agencies.

49. Section 3.11.7, second paragraph - Monitoring wells W3-3(A) and W3-4(B2) should be shown on Figure 3-13.

50. Section 3.11.9 -

    a. Same as comment 40.c, above.

    b. Second paragraph - If the results of soil samples taken during tank removal indicate a release has occurred it will be necessary to install a monitoring well immediately downgradient of tank 53.

51. Section 4.2 - As stated in previous site specific comments, it is recommended to collect a soil sample in the vadose zone immediately

51. Section 4.2 - As stated in previous site specific comments, it is recommended to collect a soil sample in the vadose zone immediately above the water table for all boreholes. The second sentence states that soil samples will be collected "at the depth of the aquifer zone that will be screened." This should be discussed in each site section and included in the soil sampling tables.

52. Section 4.3, first paragraph - PCB analyses should also be included in the list of groundwater analyses to be conducted. In addition, if the results of initial analyses detect PCBs, additional PCB analyses will need to be performed in subsequent rounds.

53. Tables 4-7 and 4-8 - Footnote "4" should be included for the PCB analyses also.

54. Section 4.5 -

    a. Table 4-12 - The proposed detection limits for copper, nickel, and mercury are above the chronic saltwater toxicity values for the respective chemicals and are not adequate in determining potential impact on natural resources.

    b. Third paragraph - The previous sampling plan, and Tables 4-6, 4-7, and 4-8 of this sampling plan, indicate that the quarterly samples for VOCs will be analyzed by gas chromatography (GC) supported by a second column confirmation. However, the current sampling plan states that all VOC samples will be analyzed by the GC/MS method. It will be necessary to conduct VOC analyses by the appropriate GC method for at least two sampling rounds since the detection limits by GC/MS for some VOCs exceed the drinking water standards. A separate table should be included showing the detection limits by the GC method.

    c. Fourth paragraph - Analyses by the GC method should also include freon 113 and total xylenes. As stated earlier, analysis for PCBs will also be required after the first round of sampling if PCBs are detected.

55. Section 4.5.1 - Same as commments 54.a and 54.b, above.

56. Section 5.1.2.2 -

    a. Second paragraph - How will the Photovac TIP I (TIP) determine when the sampling tube has been purged?

    b. Third paragraph - The procedure states that "when TIP readings indicate elevated levels," samples of soil gas will be collected for GC analysis. What is the detection limit of the TIP compared to the GC? It is important to have a low detection limit for the screening procedure (TIP reading).

57. Section 5.2.2 - The previous sampling plan proposed to collect soil samples at the aquifer of interest in order to conduct a sieve analysis; however, this section has been deleted. In order to determine the

appropriate grade of sand for the well pack, and to determine the appropriate well casing slot size, it is recommended to conduct a sieve analysis on a sample collected from the aquifer to be screened.

This section primarily addresses soil sampling associated with well drilling. Virtually no discussion is presented regarding methods for collecting shallow soil samples, sediment samples, or samples from tank excavations.

58. Section 5.2.3, fifth paragraph - Table 5-1 contains well locations to be "geophysically logged to C-aquifer depths" in Phase I. Wells to be geophysically logged to the B aquifer (B1, B2, and B3 zones) depths should also be included. A separate column or Table should also indicate the wells to be geophysically logged in Phase II. Well W9-11 is recommended for geophysical logging. Table 5-1, Site 2 - Should W2-5 read W2-8?

59. Section 5.3.1 -

    a. First paragraph - What criteria was used to select the grade of the well pack and the screen slot size? Same as comment 57, above.

    b. Fourth paragraph - The well construction techniques specified do not take into account monitoring for possible floating petroleum hydrocarbons. Well screens should be installed of sufficient length to accommodate seasonal groundwater fluctuations. No discussion is presented for construction techniques to be followed in confined aquifers.

    c. Fifth paragraph - The use of calcium chloride should be specified to allow for quick set of grout.

    d. Sixth paragraph - Describe the well completion details for wells installed below grade in areas exposed to vehicle traffic.

60. Section 5.3.2.1 - Similar to comment 60.b, above, additional details are needed for installing wells to monitor for floating petroleum products, especially in confined aquifers.

61. Section 5.3.4 - It is recommended that each well be provided with a metal tag or similar device identifying the well owner, type of installation or device installed, and key construction details such as depth, borehole and casing diameter, and screened interval.

62. Page 5-13, second sentence - This sentence should read "chemical analyses are not considered appropriate...."

63. Section 5.5.3 - Which sites or wells will have continuous water level monitoring conducted?

64. Section 5.6 - It is recommended that physical analyses be performed on selected soil samples as previously stated. The procedures for conducting the sampling and analysis should be described.

65. Section 5.7.5 - It should be specified that VOC and TPHC sample vials shall not contain any air bubbles.

66. Section 5.10.1, third paragraph - The minimum number of duplicate samples specified should indicate this will be performed for each day of sampling.

67. Section 5.10.2, second paragraph - The EPA minimum suggested field quality control measures specifies that <u>both</u> field blanks and travel blanks be collected for each day of sampling.

Attachment 2

SOLID WASTE ASSESSMENT TEST WORK PLAN
VOLUME III, DECEMBER 1987
MOFFETT FIELD NAS

This attachment summarizes comments on the Solid Waste Assessment Test (SWAT) Work Plan for the Runway and Golf Course Landfills at Moffett Field Naval Air Station. This is intended to supplement the comments provided in Attachment 1 on the landfill investigations.

2.0 - Site Information:

The Work Plan states that the Runway Landfill was used for disposal of refuse, scrap equipment, and hazardous materials from the early 1960's to 1978. Information should be provided as to the nature of closure at the site, i.e. the type of material used for cover, amount of cover placed over the fill area, and whether or not the soils were compacted. Section I.F.3 of the Draft SWAT Guidance Document includes this information as part of the general site information needed for assessment of the proposed work. If there is no information available regarding closure, an effort should be made during the SWAT investigation to obtain such data. If waste constituents are present in the soils currently covering the site, it would be necessary to sample and chemically analyze surface runoff from the site.

Uncertainty has been expressed as to the exact location of the Golf Course Landfill. As discussed in Attachment 1, previous borings conducted within the landfill boundary were only to a depth of approximately 7 feet. The reported depth of offsite fill above the landfill for construction of the golf course is 6 to 8 feet. Prior to commencing with the SWAT work for the landfill, additional investigation should be conducted in order to clearly define the limits of the landfill area. In addition, please specify the dates of the aerial photographs reviewed in attempt to identify the landfill boundaries, and include copies of these photographs.

Included in the discussion of the Golf Course Landfill is mention of a burn pit in the golf course area that was used for disposal of outdated flares and cartridge-activated devices until 1971. If possible, please be specific regarding the location of the burn pit.

4.0 - Scope of Work:

The proposed scope of work includes the construction of 5 groundwater monitoring wells at both the Runway and the Golf Course Landfill. The proposed locations of these wells have been determined assuming a general groundwater gradient to the north. At the Runway Landfill, the proposed well designated as W1-6(A), located south of the landfill, is intended to be the upgradient well. Wells designated as W1-7(A), W1-8(A), and W1-9(A),

located north, west, and east of the landfill, are the proposed downgradient wells. A similar configuration is proposed for the Golf Course Landfill.

The general approach of the proposed work for the landfills is acceptable. However, at this time, detailed information regarding subsurface lithology and groundwater flow occurrence and direction is not available for either of the landfill sites. Without such detailed information, the adequacy of the proposed groundwater monitoring, for determination as to whether hazardous wastes are migrating from either or both of the landfills, cannot be assessed. It cannot be assumed that the "upgradient" wells will provide adequate background water quality. Background water quality must be based on samples from wells that are beyond the influence of the waste facility. It is not clear that the proposed upgradient well for each site is beyond the influence of the landfill.

It is strongly recommended that additional data be acquired at each of the landfill sites prior to making determinations as to the location and number of groundwater monitoring wells. According to page 2-6 of the Sampling and Analysis Plan, Volume II, December 1987 for Moffett Field NAS, a soil boring program for the entire site is to be implemented in order to acquire detailed subsurface lithological data. The sampling and analysis plan proposes to construct at each landfill site one soil boring to a depth of approximately 250 feet below grade. It is recommended that this proposed boring at each landfill site be supplemented by several additional shallower borings around the landfill perimeters. Additional soil borings should be placed such that the more permeable zones beneath the landfills can be determined and defined.

As discussed in Attachment 1, it is recommended that three leachate monitoring wells be installed within each landfill during the Phase I investigation stage. The detailed lithologic information acquired during the Phase I soil boring program, and knowledge of groundwater gradients within the fill area, are necessary for making determinations as to appropriate locations for groundwater monitoring wells.

For determination of groundwater flow patterns and directions, groundwater monitoring well elevations should be surveyed to a common datum. Water levels in the wells should be measured at an appropriate frequency such that seasonal variation in the groundwater flow patterns at each site can be determined.

The proposed work plan has stated that surface water samples will be taken to determine if the surface water has been contaminated by hazardous substances leaking from the landfill. Please be specific as to the location and number of samples to be taken.

The proposed work plan has stated that soil samples will be analyzed for volatile organic compounds (VOCs), priority pollutant metals, pH, polychlorinated biphenyls (PCBs), and base, neutral, and acid organics (BNAs). Groundwater, surface water, and leachate samples will be analyzed for VOCs, BNAs, PCBs, priority pollutant metals, total dissolved solids, pH, specific conductance, and major anions/cations. Please be specific as to the analytical methods to be used for these analyses.

ATTACHMENT 3

QUALITY ASSURANCE PROJECT PLAN
VOLUME III, DECEMBER 1987
MOFFETT FIELD NAVAL AIR STATION

1. Section 3.1 - No background information is given regarding the 19 sites listed on page 3-2. Brief descriptions should be given for each site and a summary of the investigations conducted to date. At a minimum, the descriptions provided in the sampling plan should be referenced.

2. Section 3.2 - The objectives provided are very limited. The objectives should be expanded to include all components necessary to support a Remedial Investigation (RI), Public Health Evaluation (PHE), and Feasibility Study (FS). The objectives provided in the previous QAPP should be listed, as a minimum. In addition, the intended use of the data, the scope of the project, and the approach taken to achieve project goals should be provided.

3. Section 3.3 - It is recommended that the project activities and schedule also be included in this section.

4. Page 5-3, first paragraph - The analytical detection limits presented in Table 5-1a appear to be based on GC/MS method analyses only. However, Section 9.1.1 states that organic analyses will also be performed by "gas chromatography with electron capture detector (GC/ECD), flame ionization detector (GC/FID), photoionization detector (GC/PID), and Hall electrolytic conductivity detector (GC/HECD). As stated in comment 54.b of the Sampling and Analysis Plan comments, the detection limits by GC/MS analysis for some VOCs exceed the drinking water standards.

   Therefore, it will be necessary to conduct VOC analyses by the appropriate GC method for at least two sampling rounds. A separate table or column should be provided showing the detection limits for the GC methods listed above. In addition, the particular GC method should be specified for each compound on the Hazardous Substance List.

   Similarly, the proposed detection limits for copper, nickel, and mercury are above the chronic saltwater toxicity values for the respective chemicals and are not adequate in determining potential impact on natural resources. The detection limits for surface water samples should be below the appropriate toxicity values that are available. The detection limit for total petroleum hydrocarbon analysis should aslo be included in Table 5-1d.

5. Section 6.4, Figure 5 - The following additional information should be included on the sample collection log: analysis requested, preservative(s), and name of sample collector.

6. Section 6.5 - Any variances from approved procedures and protocols contained in the SAP and QAPP should be properly reported to the regulatory agencies.

7. Section 9.1.1 - The detection limits for the GC methods listed should be provided. The sampling frequency for conducting analyses by the GC method versus the GC/MS method should also be provided.

8. Section 11.1.1.1, third paragraph - The minimum number of duplicate samples specified should indicate this will be performed for each day of sampling.

9. Section 11.1.1.2, second paragraph - The EPA minimum suggested field quality control measures specifies that both field blanks and travel blanks be collected for each day of sampling.