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Ser 1843.1/L6053
December 7, 1995

Dear RAB Member:

Seasons Greetings.

On behalf of Moffett Federal Airfield (MFA) Base Closure Team and the Community Co-Chair, you are invited to our next Restoration Advisory Board (RAB) meeting.

Our last RAB meeting was held on November 9, 1995 at the City of Mountain View Police/Fire Administration Building in Mountain View, CA. The meeting summary is provided as enclosure (1). Our next RAB meeting will again be held on the second Thursday of the month, December 14, 1995, at the City of Mountain View Police/Fire Administration Building. The meeting will begin at 7:00 p.m. The agenda for the meeting is as follows:

7:00-7:02 PM Meeting Overview
7:02-7:04 PM Minutes Approval
7:04-7:15 PM Remedial Project Managers Meeting Report
7:15-7:35 PM Subcommittee Reports
7:35-8:50 PM Risk Assessment Presentation
7:50-7:58 PM Community Co-Chair and Vice Co-Chair Elections
8:58-9:00 PM Agenda/Schedule for January RAB Meeting

In addition, we have attached the Executive Summary from the Draft Final Station-Wide Remedial Investigation Report as enclosure (2). Attached is Mr. Bob Moss' qualification statement for the Community Co-Chair as enclosure (3). Mr. Moss' qualification letter was the only one received. Other interested members may submit their qualifications on the evening of this upcoming RAB meeting.

If you have any questions or comments, please contact me at (415) 244-2563, Mr. Hubert Chan of this office at (415) 244-2562, or Mr. Paul Lesti, Moffett's Community Co-Chair, at (415) 969-7682.

Sincerely,

Original signed by:

STEPHEN CHAO

BRAC Environmental Coordinator,
Moffett Federal Airfield

Distribution:

Moffett Federal Airfield RAB Members
Maurice Bundy, Potential RAB Member

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PRC Environmental Management Inc. (Attn: Tatiana Roodkowsky)

Montgomery Watson (Attn: Chris Peterson)

NFESC (Attn: Maureen Little)

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Enclosure 1

November RAB Meeting Summary

**MOFFETT FEDERAL AIRFIELD
RESTORATION ADVISORY BOARD MEETING**

MEETING MINUTES

**CITY OF MOUNTAIN VIEW POLICE/FIRE ADMINISTRATION BUILDING
1000 Villa Street
Mountain View, California**

THURSDAY, NOVEMBER 9, 1995

IMPORTANT REMINDER: ELECTIONS FOR COMMUNITY CO-CHAIR AND VICE CO-CHAIR WILL BE HELD AT THE NEXT MEETING. PLEASE CONSIDER NOMINATIONS.

I. INTRODUCTIONS AND MEETING OVERVIEW

Mr. Stephen Chao, Navy co-chair, opened the meeting of the Moffett Federal Airfield (Moffett Field) Restoration Advisory Board (RAB) and reviewed the following agenda items for this meeting:

- Minutes Approval
- Remedial Project Manager's Meeting Report
- Community Co-Chair and Vice Co-Chair Nominations
- Committee Reports
- Presentation: "Steps Toward Design and Construction"
- Operable Unit 5 Discussion
- Public Input
- Agenda/Schedule for December RAB Meeting

Mr. Chao announced that the public meeting regarding the proposed plan to clean up Operable Unit (OU) 5 is scheduled to take place on Thursday, November 16, 1995 at the Mountain View City Council Chamber. He encouraged all interested RAB members to attend the public meeting.

II. MEETING MINUTES APPROVAL

Mr. Paul Lesti, community co-chair, solicited comments on the minutes for the October 12, 1995, RAB meeting. The minutes were approved without amendment.

III. REMEDIAL PROJECT MANAGER'S MEETING REPORT

Mr. Joseph Chou, California Environmental Protection Agency, Department of Toxic Substances Control (DTSC), provided a report of the November 8, 1995 remedial project manager's meeting.

A. Navy Investigations and Activities Update

Mr. Chou provided an update on recent field activities conducted at Moffett Field. He reported that the Navy's contractors will conduct a round of quarterly sampling during November that will focus on B and C aquifer wells. Sixteen B- and 10 C-aquifer wells will be sampled. He stated that three new wells were installed in the wash rack area and two new soil borings were drilled to identify volatile organic compounds (VOCs) in this area. Mr. Chou indicated that 31 cone penetrometer tests (CPTs) were conducted and 24 piezometers were installed to support the iron curtain pilot test in the Site 9 area. He noted that the Navy conducted a respiration test at Site 5 to measure levels of carbon dioxide which are an indicator of subsurface biological activity. Mr. Chou stated that the bioventing test at Site 5 was continuing.

Mr. Chou also discussed the public meeting that is scheduled to be held on November 16, 1995. He emphasized that the public comment period will end on November 30, 1995. He explained that the proposed plan recommends a preferred alternative that treats the entire southern plume at OU5 by collecting the groundwater and treating it using an air stripping system. No further action (except for groundwater monitoring) is recommended for the northern OU5 groundwater plume.

Mr. Chou noted that the OU1 field work plan was to be submitted November 10, 1995. Mr. Chou announced that the field work plan will be sent to the Technical, Historical, and Educational (THE) committee and that copies of the work plan will be available at the next RAB meeting. Mr. Chou indicated that a public meeting for OU1 will be scheduled in January 1996. The public comment period for OU1 will run from December 8, 1995 through January 22, 1996.

B. National Aeronautics and Space Administration (NASA) Activities Update

Mr. Chou reported that four underground storage tanks (USTs) located at area of interest (AOI) 1 will be removed by January 1996. He also stated that NASA is excavating at AOI 6, the Lindbergh Avenue storm drainage channel, to remove lead and polychlorinated biphenyls.

Mr. Peter Strauss, MHB Technical Associates and consultant to the Silicon Valley Toxics Coalition, asked which areas were subject to federal regulation and which areas within NASA are subject to state regulation. Ms. Sandy Olliges, NASA, responded that the state regulates AOIs 4, 5, 6, 8, 10, and parts of 11, and all USTs, except two, are regulated by the state.

IV. COMMUNITY CO-CHAIR AND VICE CO-CHAIR NOMINATIONS

Mr. Lesti thanked the RAB members for the spirit of community they have provided during his term. He commended the RAB members on their dedication and hard work, and stated that he found serving as the community co-chair rewarding. However, Mr. Lesti noted that it is important to foster new leadership within the RAB and that he would not seek reelection as co-chair. He encouraged RAB members to nominate individuals to serve as co-chair and vice co-chair.

Mr. Strauss nominated Ms. Cynthia Sievers for the community co-chair position. Ms. Sievers indicated that she did not have enough time to serve as community co-chair, but that she might be willing to run for vice co-chair. Ms. Sievers nominated Mr. David Glick, Geoplexus and current community vice co-chair, for the community co-chair position. Mr. Glick indicated that his schedule and time availability were uncertain. Mr. Lesti suggested that Mr. Glick and Ms. Sievers could, perhaps, serve together as "co-cochairs". Mr. Lenny Siegel, Pacific Studies Center, asked Mr. Lesti how much time he spent as co-chair. Mr. Lesti responded that he usually spent 10 to 15 hours per month in addition to time at the RAB meetings. Ms. Sievers stated she preferred to leave nominations open for 1 month to allow members to consider choices for the positions. Mr. Glick indicated that this would be acceptable under the RAB by-laws because the terms of the current officers do not expire until January 1996. Mr. Thomas Harney nominated Mr. Siegel for the co-chair position. Mr. Siegel indicated he was often out of town and declined the nomination. Mr. Harney asked if Mr. Siegel would serve as vice co-chair. Mr. Siegel also declined this position.

Mr. Lesti stated that the nominations will remain open until the next RAB meeting. Dr. James McClure, THE committee chairman and Harding Lawson Associates (consultant to the Middlefield-Ellis-Whisman [MEW] companies) suggested that the next mailing to the RAB include a solicitation for nominations at the front of the RAB minutes.

V. COMMITTEE REPORTS

Mr. Lesti asked the committee chairs to deliver their reports.

A. Technical, Historical, and Educational (THE) Committee

Dr. McClure, THE committee chair, announced that two handouts were available at the RAB meeting. These included (1) preliminary THE committee comments on OU5, dated November 7, 1995 and (2) a memorandum dated August 25, 1995, issued by the United States Environmental Protection Agency (EPA) listing principles for environmental clean up of federal facilities. Mr. Siegel, who is a member of the committee that drafted the principles for cleanup, highlighted two key areas in this memorandum: the discussion regarding risk assessment and the role of future land use in the cleanup decision process. He stressed that risk assessments may result in the need to set priorities concerning cleanup actions considering current budget constraints. Mr. Siegel indicated that risk assessments are subject to technical limitations and that other issues, especially land use, should be stronger factors in the choice of a cleanup remedy. According to the memorandum, reasonably anticipated future land uses should be considered when making cleanup decisions for federal facilities such as Moffett Field.

Dr. McClure reviewed a letter submitted by the THE committee on November 7, 1995, to Mr. Chao regarding the feasibility study and proposed plan for OU5. The purpose of this letter was to outline topics on which the THE committee identified important questions or concerns related to OU5 and the proposed plan. Dr. McClure indicated that he would review the letter in more detail later in the meeting. As a summary, Dr. McClure stated that he believed that the OU5 modeling is not accurate, and therefore, the Navy cannot rely on the combination of stratigraphic and numerical models. He stated that, in his opinion, the OU5 design should be more conservative in proportion to the uncertainty in the existing knowledge of OU5.

Mr. Strauss noted that some concern exists among RAB members regarding the potential communication between the A aquifer and deeper aquifers. However, Mr. Strauss noted that this concern was not addressed in the THE meeting. Dr. McClure stated that the Navy's consultants should recognize this potential in preparing the feasibility study.

Dr. McClure noted that the next meeting for THE committee has been scheduled for Wednesday, November 15, 1995 at 7:00 p.m., at the Mountain View Senior Center on 266 Escuela Street.

B. Cost Committee

Ms. Christina Scott, cost committee chair and Lockheed Martin, reported that the committee prepared a draft response to the cost estimates listed in the appendix of the OU5 feasibility study report. She stated that there are various questions the subcommittee is considering in its comments. Topics of concern included costs for the following items: reinjection pilot testing, construction management, monitoring reports, installation of piezometers to demonstrate groundwater capture, startup testing, health and safety plan preparation, well drilling and installation, geological logging, subsurface fracturing, and Santa Clara Valley Water District groundwater extraction fees. Ms. Scott also expressed concerns that stainless steel casing was proposed for wells but not for the air stripper, that pumps were sized too small, and that reinjection and hydraulic fracturing required additional study before implementation. Ms. Scott stated that she will prepare a letter for the committee listing details for these and other questions.

C. Communications, Media, and Outreach Committee

Mr. Edwin Pabst stated Mr. Siegel had spoken to the Cupertino Sertoma club and Ms. Sievers had spoken to the Sunnyvale Sertoma club during the past month. He noted that Dr. McClure was scheduled to speak to the Los Alto Sertoma club on November 10, 1995. Mr. Lesti announced that the members of the communications, media, and outreach committee had drafted a brochure to encourage interested members of the community to join the RAB. This brochure was submitted to the Navy for public distribution. He indicated that a fact sheet discussing OU1 was nearly completed.

Ms. Olliges asked whether the RAB would object to the use of the RAB mailing list by NASA to distribute a fact sheet on NASA's cleanup activities. Ms. Sievers moved that the RAB permit NASA to use the RAB mailing list for the purpose stated by Ms. Olliges. Mr. Strauss seconded the motion, and the motion passed by voice vote.

VI. PRESENTATION AND OPERABLE UNIT (OU) 5 DISCUSSION

Mr. Chao introduced Mr. Tim Mower, PRC Environmental Management, Inc. (PRC), to update the RAB on the steps toward design and construction for cleanup activities at OU5. Mr. Mower explained that the process leads up to a record of decision (ROD), which represents the culmination of the remedial investigation and feasibility study (RI/FS) process. He mentioned that on February 2, 1996, the draft ROD and the draft remedial design and remedial action (RD/RA) work plan will be submitted to the regulatory agencies and be available to the public.

Mr. Mower explained that the goals of the remedial design include the hydraulic containment of the plume and the cleanup of the aquifer. These goals may be achieved through implementing an extraction system design, a treatment system design, and through monitoring and operation and maintenance (O&M) plans.

A. Extraction System

Mr. Mower stated that it is important to research the potential methodology to employ to extract the groundwater. The evaluation of groundwater extraction methods may include utilizing vertical wells and horizontal wells and trenches. He noted that in designing the extraction system, extraction locations and rates will be selected.

B. Treatment System

Mr. Mower explained that once the water is out of the ground, there are several treatment areas the Navy must address. First, the Navy must consider pretreatment requirements, including studying solids and chemical scaling control. Second, the primary treatment (air stripping) design is developed. Third, the need for secondary treatment is studied. Finally, the water discharge method is studied to evaluate options including reuse or reinjection.

Ms. Scott asked Mr. Mower whether the secondary treatment involves water or air treatment. Mr. Mower responded that the secondary treatment may include both water and air, depending on the concentrations of chemicals measured in the outputs from the treatment system.

C. Monitoring and Operation and Maintenance (O&M)

The monitoring and O&M phase involves creating a groundwater monitoring well network to evaluate physical and chemical performance. Also, sampling is conducted and the groundwater is analyzed. O&M involves system monitoring and routine maintenance tasks.

D. Design Reviews

The technical staff develops design documents including drawings and specifications, and conducts reviews at several levels, including an internal PRC review, Navy review, regulatory agency review, and a review by the RAB.

E. Implementation

There are three aspects to the implementation of the design. The first involves the Navy contracting procedures to procure a construction contractor. The second phase includes the construction of the necessary wells, piping, and treatment facilities. Third, a monitoring and performance evaluation is performed. The operation of the extraction and treatment system will be evaluated and modified as necessary to maximize the cleanup while efficiently using the available budget. This technique, called the observational approach, is also central to the design of the aquifer cleanup on the western side of Moffett Field.

F. Design Schedule

The 75-percent design will be submitted 60 days after the final RD/RA work plan is completed. The 75-percent design is scheduled to be submitted in August 1996. The final design will be submitted 90 days after the 75-percent design, or November 1996.

Dr. McClure reviewed a letter submitted by the THE committee on November 7, 1995, to Mr. Chao regarding the feasibility study and proposed plan for OU5. Some of the questions and concerns raised by the THE committee include:

- Will any planned or potential Moffett Field land use be foreclosed or made more expensive by selecting and implementing the preferred alternative?

- What is the relationship of the OU5 preferred alternative to the current and future operation and maintenance of the Moffett Field drain system and Building 191 pump station?
- Who will bear financial responsibility for future cleanup if Moffett Field goes into municipal or private control?
- The Navy's characterization of OU5 chemical distribution is based on a sparse data set.
- The Navy's stratigraphic interpretation of OU5, including the numerical model, is unrealistically detailed and not a reliable predictive tool.
- Any remedial plan must acknowledge the probable existence of other preferential flow paths and potential downward hydraulic gradients. The plan must also include the continued operation and maintenance of the subsurface drain system and Building 191 pump station.

Dr. McClure stated that the OU5 design should be more conservative in proportion to the uncertainty in the existing knowledge of OU5.

Mr. Strauss asked whether off gas treatment would be considered. Mr. Mower stated that off gas treatment would not be specified as a primary treatment, but may be considered as a secondary treatment, if air stripper off gases are expected to exceed levels set by the Bay Area Air Quality Management District.

Mr. Strauss expressed his concern regarding potential communication between the A1 and deeper aquifers at OU5. He noted that the seven groundwater monitoring wells in the A2 aquifer at OU5 are not adequate and that the RD/RA work plan should address this.

Mr. Chein Kao, DTSC, expressed concern regarding the accuracy of the cost estimates listed in the feasibility study. Mr. Brian Werle, PRC, noted that the level of detail for the cost estimate for each alternative was the same and was adequate to compare the alternatives. He added that more accurate estimates would require a full-scale design for each alternative which would be costly and time consuming.

Dr. McClure asked whether there is any public participation process mandated by law during the next phases of review. Mr. Michael Gill, EPA, stated there are no requirements for public participation past the ROD stage noted in the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA).

Mr. Siegel stressed that it is important to include in the ROD as much as is technically feasible at the time the ROD is approved. He noted that it is also important to place monitoring wells in the best possible locations, rather than adding more wells.

VII. AGENDA/SCHEDULE FOR DECEMBER RAB MEETING

Mr. Lesti announced that the next meeting of the RAB will take place on Thursday, December 14, 1995, at 7:00 p.m. He asked the RAB members to suggest agenda topics. Ms. Sievers commented that she would like to include a presentation on risk assessment on the agenda. Mr. Chao stated that it may be preferable to offer separate presentations on human health risk assessment and ecological risk assessment at two meetings. Dr. McClure reminded members that the next THE committee meeting was scheduled for December 13, 1995 to begin evaluation of the stationwide RI report.

IX. ADJOURNMENT

Mr. Lesti closed the meeting at 9:10 p.m.

Enclosure 2

Draft Final Station-wide Remedial Investigation Executive Summary

EXECUTIVE SUMMARY

This report presents the station-wide remedial investigation (SWRI) for Moffett Federal Airfield (MFA) (formerly Naval Air Station Moffett Field). MFA is located about 1 mile from the southwestern edge of San Francisco Bay in Santa Clara County, California, and the facility encompasses approximately 2,200 acres. The National Aeronautics and Space Administration (NASA) Ames Research Center is located on the northern side of the station. Since the 1950s, the primary mission of the facility has been to support naval aircraft in antisubmarine warfare training and patrol squadrons. In 1992, the station was designated for closure as an active military base under the Department of Defense (DOD) Base Realignment and Closure (BRAC) program. Operations at the facility required use of a variety of chemicals and fuels. Some of these compounds have been detected in soils and groundwater. NASA assumed control of the facility in July 1994 and the station's name was changed from Naval Air Station Moffett Field to Moffett Federal Airfield.

The primary purpose of the SWRI is to provide a comprehensive summary of all chemical data collected at MFA and to evaluate cumulative health risks caused by existing chemical concentrations. This document differs from traditional remedial investigation (RI) reports in that much of the data have been previously collected, evaluated, and presented in separate RI reports and technical memoranda. These previous environmental investigations and evaluations, however, have been conducted on an operable unit- (OU), site-, or medium-specific basis, including descriptions of nature and extent of contamination, fate and transport, and health risks. Overall, descriptions of the nature and extent of contamination and fate and transport remain unchanged from previous reports for sites that have been previously investigated. However, previous RI reports and technical memoranda have not addressed health risks on a cumulative basis (risks caused by exposure to multiple sites and media). The focus of this RI report, therefore, is not to reiterate data previously presented, but to summarize the data and use them in a comprehensive health risk evaluation.

The SWRI report includes the following operable units (OUs) and study areas:

- OU1 - Soils and groundwater at Sites 1 and 2
- OU2-West - Soils at Sites 8, 10 (Chase Park), 14-North, 16, 17, and 18
- OU2-East - Soils at Sites 3, 4, 6, 7, 10 (runways), 11, and 13
- OU5 - Aquifers on the eastern side of MFA

- OU6 - Wetlands areas at the northernmost part of MFA
- Petroleum Sites - Sites 5, 9, 12, 14-South, 15, and 19
- Additional Sites - Sites 20, 21, and 22
- Station-Wide Sites - Sites 23, 24, Weapons Storage Bunkers, Industrial Wastewater Flux Ponds, and Potential Runway Wetland

MFA is affected by activities at three other Superfund sites to the south known collectively as the MEW study area. Chemical releases of VOCs within the MEW study area created a plume of VOC-contaminated groundwater extending more than 5,000 feet north of U.S. Highway 101 beneath MFA. A record of decision (ROD) signed in 1989 requires the MEW companies to remediate contaminated groundwater in the regional VOC plume. Soils overlying the portion of the regional VOC plume beneath MFA have been remediated to cleanup standards specified in the MEW ROD. The Navy is controlling contaminants in groundwater from Navy sources in conjunction with the MEW groundwater remediation program for the regional VOC plume in the west side aquifers.

The Navy has collected extensive data during RI activities since 1983 characterizing the occurrence and distribution of chemicals at MFA. A brief description of each OU or group of sites including current environmental status follows.

OU1: Sites 1 and 2

OU1 consists of the Runway Landfill (Site 1) and Golf Course Landfill 1 (Site 2). The RI and FS reports have been completed, and the record of decision (ROD) is pending. Landfill caps are proposed for remediation at both sites.

Runway Landfill 1 covers approximately 12 acres near the north end of the runways in the northern portion of MFA. Various wastes including solvents, asbestos, paint, fuels, oils, transformer oil and filters, refuse, construction debris, and scrap equipment were disposed of at Site 1. VOCs, semi-volatile organic compounds (SVOCs), and polychlorinated biphenyls (PCBs) were detected in soils located within the landfill boundaries. Perimeter soils contained VOCs and SVOCs. Groundwater within the landfill boundaries (leachate) contained VOCs, SVOCs, and petroleum hydrocarbons. Groundwater in surrounding areas contained VOCs and petroleum hydrocarbons. Benzene and chlorinated VOCs were detected in landfill soil gas.

Golf Course Landfill 2 covers approximately 5 acres in the northern portion of MFA between the golf course and the runway. Refuse, scrap equipment, paint, paint thinners, solvents, oil, fuel filters, and sawdust contaminated with PCBs were disposed of at Site 2 from the 1940s until 1963. Xylenes, SVOCs, and PCBs were detected in the landfill soils. Perimeter soils contained SVOCs. Chlorinated and other VOCs, and SVOCs were detected in leachate samples. Surrounding groundwater contains chlorinated and other VOCs, SVOCs, and TPH. Soil gas within the landfill contained tetrachloroethene (PCE), but other typical landfill gasses such as methane were not detected.

OU2-West: Soils at Sites 8, 10 West, 14 North, 16, 17, and 18

All OU2 sites are located on the western portion of MFA, and are subject to provisions of the MEW ROD.

Site 8 is the waste oil transfer area located on the northwestern portion of MFA, between the runways and the NASA Ames Research Center. A 5,000-gallon waste oil tank and sump were removed in 1981. Former contents included waste oil, transformer oil, and solvents.

Site 10 West (Chase Park) is located on the southwestern boundary of the base, immediately north of Highway 101. No sources have been identified at Chase Park. However, Chase Park overlies the MEW VOC groundwater plume.

Site 14 North (Tanks 67 and 68) is located on the southwestern portion of the base southeast of the dry cleaners building (Building 88). Both of these tanks have been removed, and no contamination associated with the tanks was identified.

Site 16 (Public Works Steam Rack) is located east of Chase Park. Sump 60 was removed in 1991, and no contamination associated with the activities at Site 16 was identified.

Site 17 (Paint Shop Sump 61) is located on the western portion of MFA, approximately 1000 feet north of Site 14 - North. Sump 61 was used to store paint shop wastes including paint, thinner and turpentine. Sump 61 and surrounding contaminated soils were removed in 1991. No further contamination remains at the site.

Site 18 (Dry Cleaners Sump 66) received waste solvent from Building 88. The sump and approximately 400 cubic yards of contaminated soil were removed in 1994.

OU2-East: Soils at Sites 3, 4, 6, 7, 10-East, 11, and 13

The OU2 RI and FS have been completed, and the ROD has been signed. Low levels of contamination were found in soils at some of the sites, but the risks associated with the contamination were not sufficient to require remedial action. The no-action remedial option was selected for all OU2-East sites. Groundwater under OU2-East is classified separately under OU5 (the east-side aquifer).

Site 3 is located along Marriage Ditch Road, east of the runway. Releases of solvents, fuels, detergents, paint stripper and hydraulic fluid into the ditch may have occurred.

Site 4 is the former wastewater holding pond located south of Marriage Ditch Road. Site 4 was an unlined pond that received wastewater from aircraft washing, equipment maintenance, and operations in Hangars 2 and 3. from 1968 to 1978.

Site 6 is the runway apron northeast of Hangars 2 and 3. The area is currently paved and used for parking. Surface spills of solvents, fuels, oils, paint, and paint strippers may have occurred between the 1940s and 1979, before the area was paved.

Site 7 includes Hangars 2 and 3 located east of the runway. Surface spills of fuels, lubricants and solvents may have occurred.

Site 10-East includes the runways at MFA. Suspected contaminants include spilled fuels and lubricants that may have been transported to adjacent soils, ditches and drains by stormwater runoff.

Site 11 is the engine test area located east of the north end of the runway. It consists of a concrete and asphalt pad with dimensions of approximately 200 feet by 200 feet. The area was used to test aircraft engines under power. Suspected contaminants include spilled fuels and lubricants that may have been transported to adjacent soils by stormwater runoff.

Site 13 is the equipment parking area located on the eastern portion of MFA. Industrial wastewater may have been flushed into a surface drainage ditch adjacent to the parking area.

OU5: East Side Aquifers

OU5 includes all portions of the aquifers beneath MFA east of the runways that are not affected by the regional VOC plume associated with the MEW site, and excluding the groundwater at OU1. Potential sources of groundwater contamination at OU5 include Sites 3, 4, 5, 6, 7, 10-East, 11, 13, 15, and 19. Contaminants include chlorinated and nonchlorinated VOCs, SVOCs, and petroleum hydrocarbons. Three distinct aquifers (A, B, and C) could be affected by contamination at MFA.

Chlorinated VOCs were identified in two areas, a northern plume near the weapons storage bunkers, and a southern plume in the region containing Site 4, Site 7 and Tank 43 at Site 19. TPH contamination was identified at Sites 24, 5, and 19. These contaminants were all detected in the upper (A1) permeable zone of the A aquifer. These and other contaminants were also detected sporadically in other hydrologic units. Monitoring has been recommended for the northern plume, and pump-and-treat remediation has been recommended for the southern plume. The final OU5 FS was submitted in August 1995.

OU6: Wetlands Areas

OU6 is composed of the wetlands, stormwater retention ponds, and storm channels in the northern portion of MFA. The runway landfill (Site 1), the engine test area (Site 11), and Sump 64 (part of Site 15) are also in this area, but they are addressed separately. Other potential sources of contamination include the regional VOC plume and horizontal conduits including stormwater discharge and sanitary sewer lines.

VOCs, SVOCs, PCBs, petroleum hydrocarbons, organochlorine pesticides, and organophosphate pesticides have all been detected in soils and sediments at OU6. Locations where contamination was identified include the Northern and Navy Channels, Stevens Creek, stormwater retention ponds, along Lindberg Avenue, and the eastern diked marsh. Petroleum hydrocarbons were detected in surface water at the Navy and Northern Channels.

Acceptance of the OU6 RI report by the regulatory agencies is pending evaluation of human health risks.

Petroleum Sites

Six petroleum sites are scattered throughout MFA. These include Sites 5, 9, 12, 14-South, 15, and 19.

Site 5 is the fuel farm located at the eastern boundary of MFA. Soils and groundwater have been contaminated by petroleum products associated with operation of the fuel farm. Fourteen underground storage tanks (USTs) and four above ground storage tanks (ASTs) were located at Site 5. Ten of these tanks are active, and elimination from the petroleum sites program has been recommended because no contamination from these tanks was detected. Three of the tanks have been removed, and closure is recommended. Corrective measures have been recommended for soil or groundwater contamination near five of the tanks. Pilot testing of a biovent/biosparge system is under way.

Site 9 is the old fuel farm located on 11 acres on the western portion of MFA. Soils and groundwater were contaminated with fuels from leaking pipes and USTs. An air sparge/soil vapor extraction system for remediation is being designed.

Site 12 is the former fire-fighting training area located in the northwest portion of MFA. Surface soils were contaminated with jet fuel that was spilled during fire-fighting training exercises. Approximately 5,000 cubic yards of contaminated soil have been removed and treated to reduce TPH concentrations to less than 100 mg/kg. The soils were then backfilled into the excavations. Additional excavation and groundwater monitoring are planned.

Site 14-South is an operating vehicle maintenance facility in the southern portion of MFA. Leakage from Tanks 19 and 20 (USTs) and associated piping appears to have contaminated soil and groundwater. Soils and groundwater have been contaminated with petroleum fuels and VOCs. Implementation of a pump-and-treat system proved to be ineffective at Site 14-South due to low permeability soils at the site. Pilot testing of a recirculating in situ treatment (RIST) system is currently underway.

Site 15 consists of three sumps and one tank on the east side of MFA, and five sumps on the west side. Sumps 59, 63, 130 and Tank 54 are located on the east side, and Sumps 25, 42, 58, 62, and 64 are located on the west side. Petroleum contamination has been identified in soils surrounding Sumps 25, 42, and 58. All of these sumps are located on the west side of MFA, and are subject to the provisions of the MEW ROD. Sump 25 will be addressed with the corrective actions of the NEX service station because of their proximity. Sump 42 has been removed, but contamination remains. It is also near the NEX service station, so additional remedial actions (if any) will also be addressed with the NEX corrective actions. Additional investigation is required at Sump 58 before corrective actions and closure can be recommended.

Site 19 consists of tanks 2, 14, 43, and 53 located throughout MFA. All four of these USTs have been removed. Tank 2 was used to store wastes such as oils, methyl-ethyl-keytone (MEK), jet fuel and solvent. Tank 14 was used to store diesel fuel for a back-up generator in Building 158. The other two tanks were previously used to store diesel fuel, unleaded gasoline, and rinse water from the engine cleaning rack in Hangar 3. Petroleum hydrocarbons above cleanup levels were detected in soils near all four tanks. Remediation alternatives are being evaluated.

Additional Sites

Three additional sites were identified as potentially contaminated after the OU designations were developed. These are Sites 20 (Zook Road Fuel Spill), Site 21 (Patrol Road Ditch), and Site 22 (Golf Course Landfill 2).

Off-specification fuels were stored in ASTs between the present fire station and the present fire training area until 1982. These fuels were apparently spilled onto the ground in this area. Soils have been contaminated with petroleum VOCs and SVOCs. Groundwater contamination consists of chlorinated and nonchlorinated VOCs and petroleum hydrocarbons. Excavation and treatment or disposal of contaminated soils and groundwater monitoring have been recommended.

Patrol Road Ditch (Site 21) carries surface stormwater runoff from the east side of MFA and the fuel farm area (Site 5). Unknown quantities of waste fluids including motor oil, transmission fluid, and hydraulic fluid may have been disposed of in the ditch. Soil and sediment samples from the ditch contained low levels of chlorinated VOCs, as well as petroleum hydrocarbons and pesticides. No recommendations have been made for remediation pending results of the human health risk assessment

(HHRA) included as Appendix E of this report. Recommendations will be included in a separate report.

Golf Course Landfill 2 (Site 22) is located at the northeast corner of the golf course. Wastes similar to those at Sites 1 and 2 were disposed of at this landfill from the late 1940s until sometime before 1970. Soils within the landfill contain low levels of VOCs as well as SVOCs, petroleum hydrocarbons, pesticides and PCBs. Groundwater surrounding the landfill contain SVOCs and petroleum hydrocarbons. Remedial recommendations will be included in the station-wide FS report.

Station-Wide Sites

Sites 23 (Golf Course Landfill 3) and 24 (Active Petroleum Sites), the Weapons Storage Bunkers, Industrial Wastewater Flux Ponds, and Potential Runway Wetlands are sites where contamination is suspected, or are of interest for other environmentally related reasons. These sites have not been addressed in previous reports.

Golf Course Landfill 3 (Site 23) covers approximately 2 acres immediately south of the northern weapons bunkers in the northern portion of MFA. The landfill was apparently used for incidental dumping of excess soil and golf course-derived debris. Soils within the landfill contained SVOCs, petroleum hydrocarbons and pesticides.

The Active Petroleum Sites (Site 24) include the Hangar 1 fuel pits, the high-speed fuel hydrants, and the Fuel Pier.

The Hangar 1 Fuel Pits are no longer used. They consisted of three aviation gasoline (AVGAS) dispenser pits and three AVGAS valve pits in the Hangar floor. Soils and groundwater near the fuel pits contain low levels of VOCs. The groundwater contamination is believed to be associated with the regional VOC plume.

The high-speed fuel hydrants are used to fuel and defuel aircraft. They are located northwest of Hangars 2 and 3. Soil and groundwater in the area contain petroleum hydrocarbons.

The fuel pier is located at the end of a man-made peninsula that extends north from the northeastern corner of MFA to Guadalupe Sough. Soils at the fuel pier have been determined to contain petroleum hydrocarbons.

The weapons storage bunkers are located in two secured areas near the golf course. The northern bunkers are located on approximately 24 acres. The bunkers are used to store high explosives. One diesel UST and one 55-gallon diesel AST were located at the northern bunkers area. Both tanks have been removed. No soil contamination has been detected at the northern weapons storage bunkers.

The southern weapons storage bunkers are located to the south of the northern bunkers on approximately 16 acres. These bunkers are used to store high explosives and fuses. No contamination has been detected in soil at the south bunkers.

The industrial wastewater flux ponds are located south of the southern weapons bunkers. Sources of wastewater include water from the aircraft washrack, ground support equipment washrack, and rain water. Low levels of chlorinated VOCs have been detected in soils and sediments in the flux ponds.

The potential runway wetland is located between the southern ends of the runways. The source of the wetlands is suspected to be an improperly abandoned agricultural well. A magnetometer survey has indicated a possible location for such a well. The investigation is ongoing. No contamination is suspected.

Spatial analyses of antimony, arsenic, and chromium were conducted to evaluate the nature of the metals distribution in soils at MFA. The results suggest a random distribution and metals occurrences are interpreted to be natural rather than anthropogenic.

Organic chemical distribution relative to soil depth was analyzed. PCBs and trichloroethene (TCE) were used as indicator chemicals. The occurrences of these chemicals in soils between 0 and 2.0 feet bgs were compared with occurrences between 2 and 10 feet depth. The results indicate that surface deposited organic chemicals such as PCBs have remained near the surface, and chemicals detected in deeper soils are associated with contaminated groundwater. PCB detections at depths of less than 2.0 feet bgs accounted for 83 percent of the total PCB occurrences. TCE detections at depths of less than 2.0 feet only accounted for 10 percent of the total TCE detections. In addition, 93 percent of the

TCE detections in the deeper soils occurred on the west side of MFA in the area affected by the regional VOC plume.

The HHRA presents carcinogenic risk and noncarcinogenic hazard indices for residential, occupational, and recreational receptors at MFA based on an exposure area approach. Risks and hazard indices were calculated for these pathways based on exposure to the area-specific chemicals of concern (COCs). Overall, risks to residential receptors from exposure to soil were well below $1E-4$ (one-in-ten-thousand incremental excess lifetime carcinogenic risk). Some areas near OU6 had risks in excess of $1E-4$ due to exposure to PCBs in sediment and soil. Combined carcinogenic risks and hazard indices for residential receptors from exposure to both soil and groundwater were also evaluated. The risks and hazards increased in the area of the TCE groundwater plume and in areas where vinyl chloride had been detected. In some cases, the carcinogenic risks exceeded $1E-4$. In many areas the noncarcinogenic hazard indices exceeded 1.0.

Incremental carcinogenic risk and noncarcinogenic hazard indices were calculated for the occupational receptor based on the pathways described above. Very few areas pose risks in excess of $1E-4$. Again, the highest risks were associated with PCBs in soil and sediment in the OU6 area. Hazard indices also rarely exceeded 1.0. Areas associated with hazard indices above 1.0 were located primarily in the OU6 area and in ditches around the perimeter of MFA. Exposure to surface water at MFA was associated with risks less than $1E-6$ and hazard indices less than $1E-2$.

Recreational exposure to the golf course area and OU6 area is associated with risks less than $1E-6$ and $2.1E-5$, respectively. The risks at OU6 are again related to PCB detections. Hazard indices for both areas were below 1.0. Surface water exposure also was associated with hazard indices less than 1.0. Incremental carcinogenic risks from exposure to surface water were below $1E-6$.

Exposure to sample locations where lead was detected at 130 milligrams per kilogram (mg/kg) was evaluated using the California EPA Lead Exposure Spreadsheet. The results are presented in Appendix G. Some sampling locations, mostly located in ditches, were shown to produce blood lead levels in children in excess of 10 micrograms per liter.

Enclosure 3

Bob Moss Qualification Letter

December 1, 1995

Stephen Chao
Engineering Field Activity - West
Naval Facilities Engineering Command
900 Commodore Dr. - Building 101
San Bruno, Ca 94066-2402

Dear Mr. Chao;

I would like to be considered as one of the community co-chair or vice-chair nominees. I hesitated to offer my services because I have been extremely busy on a number of projects, but it appears that some of my programs will be at a lower level next year, making it possible for me to serve as a co- or vice-chair.

I have more than 6 years experience in oversight and remediation activities for 2 superfund sites in Palo Alto. I am a member of the Board and Treasurer of the Barron Park Association Foundation which has 2 Technical Assistance Grants from EPA for community representation and oversight of the 1501 and 640 Page Mill Road sites in Palo Alto. Activities at the 1501 site are moving from investigation and implementation of final cleanup to routine operation of the treatment system. Our grant for this site expires Dec. 31. The final report on our participation in the project is complete and awaits official EPA comments and approval. The 640 Page Mill will have all of the remediation and monitoring plans approved early next year and then will move to routine remediation and monitoring. Our grant for the 640 site expires in July 1996 and is not likely to be renewed beyond 1996. Ending active involvement in these sites will grant more time to work on the Moffett site.

I am an engineer at Space Systems/Floral with more than 30 years experience designing and building spacecraft. My prime expertise is in materials, processes, and contamination prevention and control. I am a Registered Professional Metallurgical Engineer in California. I am past chair, and a present member of the executive committee of American Society for Testing and Materials (ASTM) Committee E-21, Applications of Space Technology, and have been chair of subcommittee E21.05, Contamination, for almost 20 years. I received the ASTM Award of Merit and am a Fellow of ASTM. Previously I was on the editorial Board of MicroContamination Journal, and was assistant editor of the Society of Advanced Materials & Processes Engineering (SAMPE) Journal.

Other current activities include Board of Directors of Cable Communications Co-operative of Palo Alto, vice-president of the Palo Alto Civic League and past president of PACL, treasurer of the Barron Park Association, member of the Terman Advisory Committee, and secretary of PA-COMNET. In 1983 the PACL named me Citizen of the Year. I am on the Technical Advisory Committee for the 1996 Space Simulation Conference, and was on the Technical Advisory Committee for the 1994 Space Simulation Conference.

Previously I was President of La Comida de California, the senior nutrition program for Palo Alto and adjacent areas, treasurer of Council for the Arts, Palo Alto and Midpeninsula Area (CAPA), Chairman of Palo Alto School for Jewish Education, a member of the Jordan-Garland School Site Disposition Committee, and a member of the Terman Working Group.

For your information I am enclosing a copy of Fact Sheet #2 which was prepared by BPAF describing our efforts at the 1501 and 640 Page Mill Rd. superfund sites. Fact Sheet #3 is almost complete, and will be issued in January.

My experience with the 2 superfund sites, plus my other very broad experiences provide an excellent background in contamination, test and evaluation, and analytically evaluating information and promptly reaching valid conclusions. As a community member my main interest is assuring the sites are totally cleaned and present no future health risks.

If the RAB members wish to have me serve as a chair or co-chair for Moffett I will be honored and will do my best to assist in moving cleanup forward as quickly and effectively as possible.

Yours very truly,

Bob Moss

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