

**FORMER NAVAL AIR STATION MOFFETT FIELD
RESTORATION ADVISORY BOARD
BUILDING 943, EAGLE ROOM
MOFFETT FIELD, CALIFORNIA**

NOTE: A glossary is provided on the last page of these minutes.

Subject: RAB MEETING MINUTES

The Restoration Advisory Board (RAB) meeting for former Naval Air Station (NAS) Moffett Field was held on Thursday, 17 July 2008, at Building 943, Eagle Room, Moffett Field, California. Mr. Bob Moss, RAB community co-chair, and Mr. Darren Newton, U.S. Navy Base Realignment and Closure (BRAC) Environmental Coordinator (BEC) and RAB co-chair, opened the meeting at 7:10 p.m.

WELCOME

Mr. Newton and Mr. Moss welcomed everyone in attendance. Mr. Moss asked for self-introductions of those present and provided a brief agenda overview. Mr. Moss stated there is a modification to the RAB agenda. An update on Site 26, the East-Side Aquifer Treatment System (EATS), will be provided by the Navy and regulatory agencies after the update on Site 29 (Hangar 1). Mr. Moss stated that there will be two presentations provided during the RAB meeting. The first presentation will be on trichloroethene (TCE) and given by Stan Smucker of the U.S. Environmental Protection Agency (EPA). Additionally, Mr. Newton will provide an update on Site 27, the Northern Channel.

The Moffett Field RAB meeting was attended by:

RAB Members	Regulators	Navy	Consultants & Navy Support	NASA	Public & Other
11	5	2	3	4	18

ANNOUNCEMENTS

- Mr. Newton stated the Hangar 1 Engineering Evaluation/Cost Analysis (EE/CA) will be coming out for review and an electronic copy will be available to the public on the Navy's website: <http://www.bracpmo.navy.mil/bracbases/california/moffett/>.
- Mr. Newton stated the community relations contract for RAB support was recently put out for bid by the Navy. Tetra Tech EM Inc. (TtEMI) will provide the Navy with community relations support. Mr. Newton introduced Carolyn Hunter (TtEMI) and Tommie Jean Damrel (TtEMI) as the new community relations support staff. Mr. Newton thanked Tania Fragomeno (Katz and Associates) for her four years of dedicated community relations support to the Navy.
- Mr. Newton reviewed Moffett Field points-of-contact information, including the information repository and administrative record locations, and the 2008 RAB meeting schedule. A handout listing Moffett Field points-of-contact information was made available at the sign-in table.
- Mr. Newton reminded RAB members to call him or Mr. Moss for an excused absence if they are unable to attend a RAB meeting.

APPROVAL OF MEETING MINUTES

Mr. Moss asked for corrections to the 15 May 2008 meeting minutes. RAB member Arthur Schwartz asked to replace the word “of” with the word “out” in the second bullet on Page 9 of the meeting minutes.

The 15 May 2008 meeting minutes were approved as corrected. Meeting minutes are posted to the Moffett Field project website at <http://www.bracpmo.navy.mil/bracbases/california/moffett/>.

DOCUMENTS FOR REVIEW

Documents are available in CD-ROM format. Sign-up sheets for the documents listed below were circulated during the meeting.

<u>#</u>	<u>DOCUMENT</u>	<u>APPROXIMATE SUBMITTAL DATE</u>
1.	Final Site 26 Technical Memorandum	August 2008
2.	Draft Final Site 27 Remedial Action Completion Report (RACR)	August 2008
3.	Site 29 (Hangar 1) EE/CA	To be announced (TBA)
4.	Site 29 (Hangar 1) Action Memorandum	TBA

HANGAR 1 PROGRESS REVIEW

Mr. Newton stated the Navy is in the process of preparing the Hangar 1 EE/CA for distribution. Everyone who signed up to receive the Hangar 1 EE/CA on the document sign up sheet circulated at past RAB meetings will be provided a copy on CD-ROM. Mr. Newton stated the document sign up sheet is again being circulated tonight for those who want to receive a copy of the Hangar 1 EE/CA when it is issued. Mr. Newton stated that once the Hangar 1 EE/CA is out for review, the Navy will issue a news release with the public meeting information as well as providing the approximately 1600 person RAB mailing list an announcement that includes the public meeting information.

Mr. Newton stated the Navy is evaluating various meeting locations in the communities surrounding Former NAS Moffett Field for a venue large enough to host the Hangar 1 EE/CA public meeting during the third week of August 2008. The Navy is considering the American Legion Post 564 in Santa Clara, California to hold the Hangar 1 EE/CA public meeting on Wednesday, 20 August 2008. Mr. Newton asked the RAB if this location and proposed date works for their schedules.

- Mr. Schwartz suggested the Navy check into availability of the Fremont Union High School for the public meeting.
- RAB member Lenny Siegel asked how far the American Legion Post 564 in Santa Clara is from Former NAS Moffett Field. Community member Mr. Steve Williams stated the American Legion Post 564 is approximately 8 miles from Moffett Field.

Mr. Newton stated the Navy is planning to hold the Hangar 1 EE/CA public meeting from 7:00 p.m. to 9:00 p.m. Mr. Newton stated the Navy will move forward with trying to secure the meeting location and date and then notify the RAB members of the details.

SITE 26 UPDATE

Ms. Julie Crosby (U.S. Navy Remedial Project Manager [RPM]) said the Navy provided a Draft Site 26 EATS Technical Memorandum for regulatory agency review on 22 April 2008. The Navy received regulatory comments from EPA, San Francisco Bay Regional Water Quality Control Board (Water Board) and Mr. Siegel and Mr. Peter Strauss of the Center for Public Environmental Oversight. The comments received from the regulatory agencies requested the Navy turn EATS back on. The Navy responded to the request to turn EATS back on by providing an alternate suggestion of bioenhancement and phytoremediation. Phytoremediation is where plants or trees are planted at a site and the roots reach down into the groundwater and uptake contamination. Phytoremediation has been successfully used at Hunters Point Shipyard as well as other Navy sites. Ms. Crosby stated that EPA and the Water Board informed the Navy that the regulatory agencies prefer to have EATS turned back on. Ms. Crosby stated the Navy is going to work with their contractors to get EATS running while other alternatives are evaluated.

- Mr. Moss asked if EPA needs to respond to the Navy's recommendation to use bioenhancement and phytoremediation with another request to turn EATS back on. Ms. Alana Lee (EPA) stated the EPA is drafting a letter to respond to the Navy's proposal. Ms. Lee said the EPA had requested the Navy turn the system back on by 12 August 2008, which has passed. Ms. Lee stated the Navy does not believe the system is working optimally and is looking for alternative solutions. Ms. Lee stated the EPA is expecting the Navy to restore the groundwater at EATS. Mr. Moss asked what the Navy's proposed schedule is for remediation at EATS. Ms. Crosby stated that the Navy proposes to distribute the EATS work plan for phytoremediation on 18 December 2008 and conduct field activities following finalization of the workplan. Mr. Moss asked how long the regulatory agencies will need to evaluate whether the system is working once it is turned back on. Mr. Newton stated that the Navy is working with the regulatory agencies to determine the next steps.

Ms. Crosby stated the Navy is currently working on a plan to make EATS operational, but it would remain off. In past studies, the pump and treat system has only had a 17 percent success rate.

- Mr. Williams asked why the Navy would prepare a work plan to be released in December 2008 if the system is going to be turned on before then. Ms. Crosby stated the work plan would only be developed if phytoremediation would be used in lieu of turning the pump and treat system back on.
- RAB member Mr. Richard Eckert asked how the Navy will optimize the system and have a plan to shut it down in the future if it is not working. Ms. Crosby stated Navy and the regulatory agencies are evaluating alternative remedies, and the Navy's proposal is to keep EATS off while the phytoremediation pilot study alternative is being evaluated.
- Mr. Siegel stated that he and Mr. Strauss do not believe that turning on EATS is an effective way to remediate the groundwater. Mr. Siegel encourages the Navy to look at a different alternative than pumping and treating the groundwater which has been ineffective at Site 26 in the past.

TCE: DISCUSSION AND PROPERTIES

Mr. Smucker provided a presentation on TCE including what TCE is, the toxicity of TCE, the EPA's updated health risk assessment of TCE, information on the updated draft Preliminary Remediation Goal (PRG) table and upcoming draft inhalation guidance, and the breakdown products of TCE in the environment. The presentation slides are attached to the RAB meeting minutes for reference.

TCE is a common contaminant found at approximately 60 percent of Department of Defense (DoD) sites. TCE was historically used as a cleaning agent for metal parts. TCE can migrate into groundwater or evaporate into the air, which can affect human health. In the 1980s, EPA identified both TCE and tetrachloroethene (PCE) as carcinogens. The EPA is currently reassessing TCE toxicity by examining exposure to and the breakdown of TCE in the human body. This assessment will evaluate the weight of evidence of TCE effects on human health. The EPA is in the process of receiving peer review comments on the 2001 TCE toxicity assessment report. The peer review comments were compiled in a publication released in 2006. The final TCE assessment should be available in 2010 or later. The change of the federal administration in November 2008 may delay the release of the Final EPA TCE assessment.

Mr. Smucker stated the scientific information on TCE health effects comes from studies of people exposed to high levels in the workplace, studies of rats exposed to high levels in the laboratory, and a few studies of people exposed to lower levels in drinking water. Mr. Smucker went over the non-cancer and cancer health effects of TCE. TCE affects the central nervous system when humans are exposed to TCE at high levels. Neurological effects of TCE are considered non-cancer effects. Cancer effects to humans from exposure to TCE include kidney cancer, liver tumors, and lymphoma cancer. Any exposure to TCE carries some risk of cancer, but there is a low risk to humans if there is minimal exposure.

- Mr. Moss asked if there is a correlation to TCE exposure and Parkinson's disease. Mr. Smucker stated EPA conducted an evaluation five years ago and did not find a strong correlation between TCE exposures and Parkinson's disease.
- Mr. Siegel stated the University of Kentucky had studied Parkinson's disease and showed a risk factor for those exposed to TCE.
- Mr. Schwartz stated he has Parkinson's disease and was employed in the plastics industry and exposed to many toxic chemicals during his career.

Mr. Smucker stated many studies have been conducted on Parkinson's disease and there has not been conclusive evidence as to what causes it. Mr. Smucker stated the EPA does not currently have indoor air guidelines for TCE since EPA's toxicological assessment of TCE is not final. However, there are other agencies that have recommended guidelines that can be used during the interim. The Agency for Toxic Substances and Disease Registry (ATSDR) has recommended TCE guidelines for short-term exposures (less than a year). ATSDR data shows that limited exposure to TCE at levels observed in buildings at Moffett or MEW is not a problem. For long-term or lifetime exposures to TCE, EPA Region 9 is currently applying the California EPA exposure guidelines corresponding to a one in one million chance in a population (1:1,000,000) for developing cancer over a lifetime to calculate their human health risk assessment and to develop screening criteria for TCE.

Mr. Smucker went over the PRG table currently being developed and updated by the EPA. Mr. Smucker stated the cancer guidelines for children are changing, which is being accounted for in the revisions to the PRG table. EPA included an additional safety factor for cancer-causing substances that are determined to damage DNA through a mutagenic mechanism and also included indoor air screening values for workers in addition to the residential screening values.

- A community member asked if the new PRG table will have an impact on the indoor air cleanup goals for residential standards. Mr. Smucker stated that the new PRG table would not affect the residential indoor air standard of 1 ug/m³ TCE that EPA is currently using at Moffett and MEW.
- A community member asked if a building has indoor air quality at 7.0 micrograms per cubic meter (µg/m³) if it needs to be cleaned up to the PRG. Mr. Smucker stated that nine criteria for remedial alternatives are factored in and the final cleanup numbers are site-specific.
- A community member asked how accurate the action limit is. Mr. Smucker stated that the measurement of TCE in air is very accurate. Most of the uncertainty with action limits relate to the toxicity value that is used to derive action limits. In general, toxicity values are considered order-of-magnitude estimates. EPA does not have the final TCE number determined; however, the PRG will use one in one million for development of the PRG.
- A community member asked why the PRG for worker exposures was changed. Mr. Smucker stated the new PRG equation proposed by EPA is more scientifically-based, but somewhat less conservative than before. The target risk is going to stay the same; however, the exposure inputs will change. The old EPA guidance on exposure limits was from 1989 and considered inhalation exposures to be similar to oral exposures. However, assessing inhalation exposure is different than oral exposure and the new equation takes this into account.
- A community member asked if TCE is exhaled from the body in the same amount that enters the body during inhalation. Mr. Smucker said some of the TCE is exhaled, but some TCE remains in the surface area of the lung and is not expelled. There are pharmacokinetic models that map the exposure of TCE when inhaled.
- A community member asked if the inhalation rate takes into consideration a person's body weight. Mr. Smucker stated the toxicity value in the PRG equation assumes a human inhalation rate of 20 cubic meters per day for a 70 kilogram person. This assumption is used when converting from animal study results to a human equivalent concentration, but inhalation rate and body weight are no longer used in the exposure part of the PRG equation. The exposure factor in the PRG calculation focuses on the exposure time (at the site) and the duration (amount of years at the site). The generic PRG calculation considers a worker's exposure of 8 hours a day, 5 days a week, at the site for 25 years. A residential calculation includes 24 hours a day, 7 days a week, at the site for 30 years.
- Mr. Siegel stated that an exposure time of 8 hours a day for a worker seems low. The calculation should take into consideration a 50 hour work week. Mr. Siegel suggested that the calculation for a worker should be the same as the residential standard to be conservative enough. Mr. Smucker stated that using the residential exposure time of 24 hours per day for the worker calculation would bring the PRG down to 2 µg/m³, and an exposure time of 12 hours a day would bring the PRG down to 4 µg/m³. Mr. Smucker acknowledged that workers in Silicon Valley may work longer than 8 hours per day. He also noted that the draft Remedial Investigation for vapor intrusion for MEW / Moffett describes a worker exposure time of 9.5 hours and that EPA used this conservative assumption when deriving a site-specific worker PRG of 5 ug/m³ TCE. Mr. Siegel stated that EPA should examine the surface area of the lung of a child when determining the calculation. Some studies have shown that the surface area of the lung of a child is much larger than that of an adult.
- A community member stated that body weight should still be taken into consideration when assessing the exposure to TCE.

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- A community member asked why the new calculation of the worker PRG of $5 \mu\text{g}/\text{m}^3$ seems less protective than the old calculation resulting in a PRG of $2.7 \mu\text{g}/\text{m}^3$. Mr. Smucker stated that the new PRG equation replaces inhalation rate / body weight with exposure time, which is scientifically more accurate. Inhalation rates can differ depending on the type of activity someone is doing at a site. A worker doing strenuous activity generally requires a higher inhalation than someone who is sitting at a desk at a site. However, inhalation rate does not correlate with the internal dose of TCE, whereas exposure time does correlate with internal dose. This is why the PRG equation has changed (see slide).

TCE Breakdown (Anaerobic Conditions) Update

Mr. Smucker provided an update on a pilot study using molasses to breakdown TCE in groundwater. The EPA is assessing ways to breakdown TCE in anaerobic conditions because these conditions generally require less energy than breaking down TCE in aerobic conditions. When TCE is broken down in an anaerobic environment, however, there are concerns about the byproduct vinyl chloride, which is detrimental to children.

- A community member stated that a remediation alternative is governed by geochemistry conditions. An application of a stimulant will need to be addressed if an aerobic alternative is determined for TCE cleanup of groundwater.
- Mr. Siegel stated that in January 2003, a presentation was given by EPA Region 9 at the Mountain View community center based on information developed in 2001 to address TCE. The 2001 EPA assessment of TCE was more protective to human health than EPA's previous TCE assessment back in the 80's. Mr. Siegel thought that the 2001 draft assessment was no longer recommended by EPA Region 9 due to interference by the White House. Mr. Siegel recommended that TCE in indoor air from vapor intrusion should be cleaned up to the same levels as outdoor air.

Mr. Smucker stated that EPA is looking at PCE screening levels based on California standards. PCE is a chemical that is slightly more toxic to humans than TCE.

- Mr. Siegel stated the higher New York cleanup standard of $100 \mu\text{g}/\text{m}^3$ PCE is based heavily on the chemical dry cleaning industry.

Mr. Smucker encouraged the RAB to provide the EPA comments on their revised PRG table. Comments are being accepted through September 2008.

SITE 27 UPDATE

Mr. Newton provided an update on activities conducted at Site 27. For reference, the presentation slides are attached to the RAB meeting minutes. Mr. Newton stated the Navy conducted remedial activities at Site 27 in 2006 and 2007. Site 27 includes the Northern Channel, Marriage Road Ditch, and the North Patrol Road Ditch. The contaminants of ecological concern at Site 27 are polychlorinated biphenyl (PCBs), pesticides and metals. The Navy signed a Record of Decision for Site 27 in 2005 which determined the removal of contaminated sediments was necessary. Once excavation of the channel and ditches was completed, confirmation samples were taken. Prior to excavation, pre-construction activities included surveying the area and sampling, and putting up temporary support facilities and fencing. During construction, approximately 68,000 cubic yards of sediment was excavated and disposed of offsite.

- A community member asked whether groundwater pooled in the bottom of the channel during the excavation of sediment. Mr. Brian Maidrand (Tetra Tech EC [TtEC]) indicated it was unclear whether it was shallow groundwater or water from the old evaporation ponds next to the channel that seeped under the berm, but that in a good portion of the channel there was water in the bottom of the channel during excavation.

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Mr. Newton stated that confirmation samples were taken after the excavation of sediment was completed.

- Mr. Williams asked what was found in the confirmation samples. Mr. Newton stated that all of the cleanup goals were met except for selenium. Mr. Maidrand stated a good portion of the remaining clay was below the selenium cleanup level and the highest concentrations of selenium were excavated and taken offsite for disposal. Mr. Williams asked if any of the high levels of selenium were found in the channel berms. Mr. Newton stated that there were no selenium levels exceeding the cleanup level for the channel berms.

Mr. Newton stated the Site 27 Technical Memorandum presents information indicating selenium is a naturally occurring metal in sediments in the South Bay.

- Don Chuck (National Aeronautics and Space Administration [NASA]) asked if higher levels of selenium found could be from aircraft at the Former NAS Moffett Field. Mr. Newton stated all sediment with high levels of selenium was removed and taken for offsite disposal.
- RAB member Libby Lucas asked if there is any information about high levels of selenium at the quarry in the Los Altos hills. Mr. Newton replied the Navy does not have information on selenium levels at the quarry.
- A community member asked why the Navy was removing selenium from the channels if it is naturally occurring in the area. Mr. Newton stated the Navy used risk calculations to determine what concentrations of selenium needed to be removed from the channel; however, a few locations remained where the risk-based cleanup goal was not achieved.
- Mr. Siegel stated that selenium levels are high in California due to the agricultural business and the pesticides used.
- Mr. Moss asked what the next step is for Site 27. Mr. Newton stated the Navy is working with the regulatory agencies on the path forward to complete work at Site 27.

RAB BUSINESS

Future RAB Topics

Mr. Newton asked for topic suggestions for future RAB meetings. Mr. Newton said a discussion of the 2009 RAB meeting schedule could be added to the agenda for 11 September 2008 RAB meeting. Mr. Newton suggested potential presentation topics for future RAB meetings could include updates on EATS, Site 28 (West-Side Aquifer Treatment System [WATS]), Sites 8 and 25, the Landfill Sites, and the Eastern Diked Marsh. Mr. Newton stated the regulatory agencies are currently reviewing the Proposed Plan for Sites 8 and 25. A community member indicated that it may be interesting to the RAB have a presentation on the history/development at the Former NAS Moffett Field in a future presentation.

Moffett Community Housing

Mr. Moss stated that Google and a number of Universities are looking to lease the community housing area.

- A community member stated that a number of Universities are requesting approximately 70 acres at the Former NAS Moffett Field for research and housing facilities which will draw in over a billion dollars in new economy for the community.
- Palo Alto resident Georgina Hymes stated that she wants to make sure that Former NAS Moffett Field is not leased out to outside businesses. The site should be left open in case a military need happens in the future. The base should be kept available for those needs.

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Orion Park Update

Mr. Newton stated that in May 2008, U.S. Office of the Secretary of Defense (OSD) provided a clarification letter to the U. S. Army and U. S. Navy indicating that the U. S. Army has responsibility for the environmental conditions of the property that were a result of past Department of Defense activities... Ms. Lee stated that groundwater at Orion Park has not been addressed. The EPA is in the process of looking at the potentially responsible parties to address the groundwater concerns at Orion Park. Ms. Lee stated the EPA will work with the Army on the groundwater at Orion Park.

Regulator Update

Water Board

Ms. Elizabeth Wells (Water Board) stated the Navy provided a presentation to the RAB on the petroleum program at Former NAS Moffett Field a few months ago. The regulatory agencies meet with the Navy on a monthly basis to discuss the petroleum program.

EPA

Ms. Lee stated EPA is requesting an optimization plan from the Middlefield-Ellis-Whisman (MEW) site be completed in September 2008. EPA has contacted each party responsible for the MEW site and they have each agreed to provide their own optimization plan.

Community Comments

A community member asked if there is an update on Site 29, Hangar 1 because it is important that Hangar 1 be kept in the community. Mr. Newton stated the Navy will be having a public meeting in August 2008 to take comments on the Hangar 1 EE/CA.

Ms. Hymes stated she thought Hangar 1 was stable. A news cast reported that a blimp is heading from Germany and will land at Hangar 1. Mr. Chuck stated the blimp from Germany will land at the Former NAS Moffett Field and be stored in Hangar 2.

RAB Schedule

The next RAB meeting will be held from 7 to 9:30 p.m. at Building 943, Moffett Field, California. The RAB meeting schedule for the remainder of 2008 is as follows:

- 11 September 2008
- 13 November 2008

Adjourn

The meeting was adjourned at 9:45p.m., and Mr. Newton thanked everyone for attending. Mr. Newton can be contacted with any comments or questions:

- Mr. Darren Newton
BRAC Environmental Coordinator, Former NAS Moffett Field, BRAC Program Management Office West;
1455 Frazee Road, Suite 900; San Diego, CA 92108; Phone: 619-532-0963; Fax: 619-532-0940;
E-mail: darren.newton@navy.mil

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GLOSSARY OF TERMS USED IN THESE MINUTES

$\mu\text{g}/\text{m}^3$ – Micrograms per Cubic Meter	PCE - Tetrachloroethene
ATSDR - Agency for Toxic Substances and Disease Registry	PRG - Preliminary Remediation Goal
BEC – Base Realignment and Closure Environmental Coordinator	RAB – Restoration Advisory Board
BRAC – Base Realignment and Closure	RACR – Remedial Action Completion Report
DoD – Department of Defense	RPM – Remedial Project Manager
EATS – East-Side Aquifer Treatment System	TBA – To Be Announced
EE/CA – Engineering Evaluation/Cost Analysis	TCE – Trichloroethylene
EPA – U.S. Environmental Protection Agency	TtEC – Tetra Tech EC, Inc.
MEW – Middlefield-Ellis-Whisman	TtEMI – Tetra Tech EM, Inc.
NAS – Naval Air Station	VOC – Volatile Organic Compound
NASA – National Aeronautics and Space Administration	Water Board - San Francisco Bay Regional Water Quality Control Board
PCB – Polychlorinated biphenyl	WATS – West-Side Aquifers Treatment System

RAB meeting minutes are posted on the Navy's environmental Web page at:
<http://www.bracpmo.navy.mil/bracbases/california/moffett/>.