FORMER MARINE CORPS AIR STATION TUSTIN
RESTORATION ADVISORY BOARD MEETING
May 14, 2008
MEETING MINUTES

The 81st meeting of the Restoration Advisory Board (RAB) for former Marine Corps Air Station (MCAS) Tustin was held on Wednesday, May 14, 2008, at the Tustin Senior Center in the Boardroom. The meeting started at 7:10 p.m. and was adjourned at 8:52 p.m. These minutes summarize the discussions and presentations from the RAB meeting.

WELCOME/INTRODUCTIONS/AGENDA REVIEW

Mr. Don Zweifel, RAB Community Co-Chair, welcomed everyone and asked for self introductions. Ms. Debra Theroux, Interim Base Realignment and Closure (BRAC) Environmental Coordinator (BEC) and Interim Navy RAB Co-Chair, introduced herself and thanked everyone for coming. She informed the RAB that she is also the Deputy Base Closure Manager for former MCAS Tustin, former MCAS El Toro, former Naval Training Center San Diego and Mare Island. She has been with BRAC for the past 6 to 7 months. During the previous 12 years she worked for the Naval Facilities Engineering Command in environmental planning. She said that the Navy is hopeful that a new BEC will be identified by the next RAB meeting.

Ms. Theroux said that Mr. Ram Peddada, DTSC, is unable to attend due to illness. Mary Lynn Norby, RAB member, may not be able to attend but could arrive late (she arrived shortly after the start of the meeting).

OLD BUSINESS

Approval of 11/14/07 and 2/20/08 RAB Meeting Minutes – Mr. Zweifel RAB Community Navy Co-Chair

Mr. Zweifel asked for comments or input on both sets of meeting minutes. No comments were provided. Mr. Zweifel asked a voice vote for approval of the minutes as they stand. Both sets of meeting minutes were approved by the RAB by voice vote.

NEW BUSINESS

Ms. Theroux reviewed the RAB meeting agenda. The key topics for this RAB meeting include: the Environmental Status Update, Regulatory Agency Update, and a presentation on the Operable Unit (OU) 4B Feasibility Study (FS).

Ms. Theroux presented a series of slides listing key project contacts from the Navy and the regulatory agencies, information on the Administrative Record file and Information Repository locations, and Navy, Department of Defense and regulatory agency websites that provide a variety of environmental information. This information was also available as handouts on the information table.

Ms. Theroux informed the RAB that she is available to answer any questions. RAB members can also contact Ms. Content Arnold, Lead Remedial Project Manager (RPM), or any of the regulatory agency representatives. Contact information was provided on the information table.

The next RAB meeting is scheduled for Wednesday, August 6, 2008. The location and time will be determined and this information will be provided well in advance of the next meeting. Based on the anticipation of having the new BEC in place by the next RAB meeting, the RAB Community Co-Chair election will be held at the next RAB meeting. The following quarterly RAB meeting is currently scheduled for November 2008, and the specific day, location, and time are yet to be determined.

Installation Restoration Program (IRP) Environmental Status Update

Ms. Theroux provided the former MCAS Tustin Environmental Status Update. She focused on ongoing projects and steps that will follow.

- Operable Unit (OU)-1A (IRP-13 South – 1,2,3-trichloropropane [TCP] Groundwater Plume) and OU-1B (IRP-3 and IRP-12 – trichloroethene [TCE] Groundwater Plume) --- The treatment systems are in place and ongoing operation and maintenance activities are underway. Biweekly, monthly, and quarterly inspections are conducted. Quarterly effluent sampling in compliance with the Orange County Sanitation District (OCSD) is conducted to meet discharge requirements. Quarterly groundwater monitoring is also performed to track system performance and optimize the system. The Quarterly Groundwater Progress Monitoring Reports are scheduled for issuance on June 30, 2008. The Navy plans to issue the Operating Properly and Successfully (OPS) Reports in 2009.
- OU-4B (IRP-5S[a], IRP-6, IRP-11, IRP-13W, Miscellaneous Major Spill (MMS)-04, and Mingled Plumes Area [MPA]) – Ms. Theroux said the update for OU-4B would be covered later in the featured presentation for this RAB meeting.
- MTBE (methyl tert-butyl ether) Groundwater Plume (Underground Storage Tank [UST] Site 222) - The MTBE plume remediation system is in place and is operating around the clock. Ongoing maintenance activities are also being conducted. Quarterly effluent sampling for compliance with OCSD discharge requirements is also being performed. This summer the Navy plans to issue the Quarterly Groundwater Progress Monitoring Report.

Discussion

Ms. Susan Reynolds, RAB member, asked what the timeframe is for the OU-1A/1B treatment systems to meet OPS criteria. Ms. Arnold explained that typically the treatment systems have to be in place and operating for one year for consideration under OPS criteria. After the regulatory agencies concur on the OPS Reports, the OUs are considered environmentally suitable for transfer.

Regulatory Agency Update - Regulatory Agency Representatives

Ms. Patricia Hannon, Project Manager, Regional Water Quality Control Board, Santa Ana Region

Ms. Hannon said since the previous RAB meeting, she reviewed the Technical Memorandum for the Supplemental Investigation at IRP-6 and the MPA. This document contained results and data analysis on additional groundwater sampling. Currently, she is reviewing the Draft FS for OU-4B. She expects to submit comments to the Navy by the end of May 2008.

Presentation – Revised Draft Feasibility Study for OU-4B, Mr. Jim Callian, Navy Remedial Project Manager and Mr. Dan Carroll, Kleinfelder (Navy Contractor)

Prior to the presentation, Ms. Theroux followed up on a request from the previous RAB meeting about conducting a RAB subcommittee meeting to discuss agency comments on the Draft OU-4B FS Report. Planning of the subcommittee meeting was tabled until the end of the RAB meeting.

Mr. Callian explained that the presentation would provide a summary of current conditions at the six OU-4B sites, a summary of the environmental investigations, remedial action objectives (RAOs), a summary of the remedial alternatives, a comparison of the alternatives, and the schedule for the next steps in the project. Mr. Callian said that Table 1-2 in the OU-4B FS Report has a thorough summary of the FS sites. He recommended that RAB members take a look at this table. He pointed out that a glossary of acronyms is presented on the last page of the presentation handout.

Mr. Callian showed a map that presented the locations of the six OU-4B sites and their associated groundwater plumes. The primary chemical of concern (COC) at five of the sites is TCE and at IRP-6 the primary COC is 1,1-dichloroethene (DCE). These chemicals are dissolved in and diluted by groundwater. The six sites are divided into three "low-concentration" sites including MMS-04, IRP-11, and IRP-13. The three "moderate-concentration" sites are the MPA, IRP-5S(a), and IRP-6. Groundwater contamination is confined to the first water-bearing zone (WBZ) at all five plumes, except for the MPA, where TCE is also present in both the first and second WBZs. A TCE plume was discovered in the second WBZ during the Supplemental Investigation.

The map also showed the Carve-Out areas that remain in Navy control. He also oriented RAB members as to where the plumes were located by pointing out specific streets and the location of the Costco gas station. Except for IRP-5S(a), all OU-4B sites are included within Carve-Out boundaries. Another map was passed around that provided further perspective on the locations of the plumes.

Generally, concentrations of COCs in the low-concentration plumes have been decreasing due to natural degradation.

- IRP-11 - maximum reported TCE concentrations were 15 micrograms per liter (µg/L) in 1996, and 8.5 µg/L in 2003. The current size of the plume is approximately 190 feet by 50 feet.
- IRP-13 - maximum reported TCE concentrations were 25 µg/L in 1996, and 16 µg/L in 2003. Currently, the plume size is approximately 270 feet by 150 feet.
- MMS-04 – maximum reported TCE concentrations were 18 µg/L in 1996, and 7.4 µg/L in 2003. The approximate size of the plume is currently 12 feet by 20 feet.

These three low-concentration plumes will be hydraulically contained by the remedial systems that are currently operating at OU-1A and -1B. Mr. Callian clarified that contaminants flow with the groundwater to the extraction wells that comprise the OU-1A and -1B remediation systems. The plumes at OU-1A and -1B are not undergoing pump-and-treat action, but these systems are hydraulically containing their respective plumes so that the contaminants do not migrate any farther. He noted that at MMS-04, a possible option is to install a single monitoring well at the center of the small plume and sample on a quarterly basis for a year. This plume was based on a previous result from a single hydropunch sample at an approximate concentration of 7 µg/L If concentrations of TCE in this new well are below 5 µg/L then this site may be able to be closed out.

Environmental conditions at moderate-concentration sites are as follows:

- IRP-5S(a) - maximum reported TCE concentration is approximately 193 µg/L. The size of the plume is approximately 850 feet by 350 feet.
- IRP-6 – maximum reported concentration of 1,1-DCE, the primary COC, is approximately 179 µg/L. Plume size is approximately 120 feet by 50 feet. The MCL for 1,1-DCE is 6 µg/L.
- MPA – maximum reported TCE concentration in the 1st WBZ is approximately 23 µg/L and 34 µg/L in the 2nd WBZ. The approximate size of the plume is 2,130 feet by 340 feet. This plume is located between IRP-12 and IRP-13S.

Mr. Zweifel commented that military practices resulted in a lot of spillage of contaminants, probably more than the Navy has reported. Mr. Callian acknowledged that disposal activities that were conducted in the past were common practices used by both military and civilian agencies. At that time, the military did not know of the consequences that such disposal practices would have on the environment. Since those times, a lot of natural degradation of the contaminants in groundwater has occurred. Mr. Tim Heironimus, Project Manager with Bechtel, a Navy consultant, reminded the RAB that at IRP-13W, contaminated soil was previously excavated preventing a lot of contamination from reaching the groundwater (preventing a continuing source of contamination). Characterization of these sites has been underway for many years and the Navy has a thorough understanding of the environmental conditions and it is time to design remedies to address these sites.

Ms. Arnold said that a remedy is in-place for IRP-13S (OU-1A). This is not part of OU-4B, but she wanted to point out that results of past practices are being addressed. A handout covering the OU-1A and OU-1B presentation from the last RAB meeting is available on the information table which covered the design, remedial action implementation, and the operation and maintenance (O&M) process which is underway. This is leading up to the development of the OPS Report for IRP-13S in 2009.

A RAB meeting attendee asked how long after the OPS phase is a typical site considered to be clean. Mr. Callian responded that it depends on the remedial action taken. For example, cleanup at UST Site 222, will be quicker, possibly in a 5 to 7 year timeframe, while other sites may take longer, possibly 30 years. It depends on the nature of the contaminant. The purpose of hydraulic containment is to keep the plumes from further migration, letting natural degradation processes act.

Mr. Zweifel asked about the contaminants impact on the parcel of land associated with the education center. He was informed that the aforementioned parcel includes MMS-04. He acknowledged that he is satisfied with the option described by Mr. Callian for monitoring this site.

Mr. Callian introduced Mr. Dan Carroll, the technical lead on the FS for OU-4B, who presented the details on the FS Report. Mr. Carroll said that he has developed approximately 10 FS reports for a variety of Navy sites. At the OU-4B sites, soil was previously addressed and no further action is necessary so the FS Report only addresses groundwater.

Before Mr. Carroll got started, Mr. Zweifel interjected with a question about hydraulic conductivity and expressed concern over the speed of the flow of contaminants in

groundwater. He said Table 1-2 in the FS Report indicated a hydraulic conductivity in the first WBZ as 25 feet per day. Mr. Callian indicated that the hydraulic conductivity is a physical property of the aquifer that can be determined by conducting pump tests, not the actual speed of groundwater in the subsurface . Contaminants move at a much slower rate, and normally contaminant flow is a very small fraction of the speed of groundwater flow. Contaminants also tend to adhere to the soil in the subsurface, a process called retardation.

Mr. Heironimus explained that what is not seen in the equation is the hydraulic head which is the elevation of groundwater flow from a higher elevation to a lower elevation. If there is a very gentle, or gradual hydraulic gradient, then the overall groundwater flow is still very slow even though the hydraulic conductivity is high. Groundwater flow does not actually travel at 25 feet per day; this variable is only part of the equation. Total groundwater flow is the change in the hydraulic head multiplied by hydraulic conductivity which together equates to the groundwater flow. If there is a steep slope, groundwater would flow much faster than if the subsurface is relatively flat. At former MCAS Tustin, subsurface conditions for groundwater are relatively flat, so groundwater moves slowly. The overall net effect is that the contaminants flow just a few feet each year.

Mr. Callian added that the Navy has collected data to determine how fast contaminants are moving. Evidence shows that contaminants were released onto the ground surface in approximately 1949, and since that time, a plume was formed and migrated downgradient only about 1,000 feet, which equates to a rate of only a few feet per year. The hydraulic gradient in this area is about 3 feet over a distance of 1,000 linear feet so there is not much driving force to push the water (the water level falls only 3 feet vertically over a horizontal distance of 1,000 feet). Ms. Arnold suggested that the RAB look at the groundwater modeling data in the FS Report that covers a span of several years to better understand what was analyzed.

Mr. Carroll provided more information on solvent plumes. He explained that right after a spill, plumes will grow for a period of time, such as 20 to 30 years. At some point, plumes stop growing and start to contract. As plumes age and the source of contamination either gets remediated or degrades away over time, solvent plumes will stabilize and start contracting again. Also, natural processes are at work to degrade these types of plumes. The state of the plumes at OU-4B was closely examined, and this was used in developing the strategies for the remedial alternatives.

For the FS, the low-concentration sites were grouped together and evaluated. The moderate-concentration sites were also grouped together and evaluated. Computer modeling of the groundwater was conducted to help in the evaluation of the alternatives. Data from the recently started hydraulic containment systems at OU-1A and OU-1B was incorporated into the modeling so current conditions are accounted for. Human-health risks were evaluated under two scenarios: 1) assuming that the shallow contaminated groundwater would be extracted and used for domestic purposes, even though it is not; and 2) assuming institutional controls are implemented such that groundwater would not be used for domestic purposes.

Remedial action objectives for the sites are to protect human health by limiting use of shallow groundwater containing COCs at concentrations exceeding health-protective levels; reduce concentrations of COCs in shallow groundwater at areas of attainment for OU-4B sites to health-protective levels to the extent practicable; and meet the

preliminary cleanup goals for groundwater that are based on beneficial use. Cleanup goals are 5 µg/L for TCE and 6 µg/L for DCE.
Six alternatives were evaluated in the FS Report. These include:

- Alternative 1 – No Action, this evaluation is required as a basis of comparison.
- Alternative 2 – Institutional Controls (ICs).
- Alternative 3 – Monitored Natural Attenuation (MNA) and ICs.
- Alternative 4 – *In situ* Bioremediation (ISB), MNA, and ICs.
- Alternative 5 – *In situ* Chemical Oxidation (ISCO), ISB, MNA, and ICs. ISCO is a more aggressive method than ISB for treating the highest concentrations of solvents.
- Alternative 6 – Hydraulic Containment, MNA, and ICs. Hydraulic containment would be similar to what is being applied at OU-1A and OU-1B.

Mr. Carroll explained that these are conceptual alternatives and the purpose of the FS is to compare different options for evaluation and decision purposes. The fine points of the selected remedy are determined later in the remedial design stage.

A chart that shows which alternatives were evaluated for each site was presented. For the low concentration sites, only Alternatives 1 through 3 were evaluated. It is not worthwhile to spend a significant amount of money to aggressively and actively clean up these sites, since they are just a few years away from being cleaned up under less aggressive alternatives. For the moderate concentration sites, all the alternatives were evaluated with a couple of exceptions. For IRP-6, Alternative 6 was not evaluated because it is too far from the treatment systems that are now operating, and it would require trenching around or under Costco and Lowe's parking lots and this was considered too expensive and disruptive. For the MPA, Alternative 5 was not evaluated because the maximum concentrations reported at this site were not high enough for these technologies to be effective.

Descriptions of Alternatives 2 through 6 were provided.

Alternative 2 – ICs - would require conducting a pre-design groundwater investigation to provide additional information to refine groundwater conditions with current information. This would involve well installation and sampling. The pre-design investigation is also a component of Alternatives 3 through 6. ICs would prohibit the use of shallow groundwater for domestic purposes and protect the monitoring wells, piping, and other structures put in place for monitoring. It was explained that with ICs, there is a 5-year review program where an evaluation would be conducted (at a minimum of every 5-years) to determine whether the cleanup goals have been met, and if the remedy is still effective and protective of human health. Under this alternative, sampling would only be conducted for VOCs. Alternative 2 and the remaining alternatives all include 5-year reviews to determine if cleanup goals have been met.

Alternative 3 – MNA and ICs - is similar to Alternative 2, but there is much more sampling to monitor natural processes that are currently degrading (decreasing the concentrations) the COCs. The increased sampling provides a better understanding of these processes, including what types of bacteria are in the groundwater and the rate of degradation of the COCs.

Alternative 4 – ISB, MNA and ICs - is similar to Alternative 3, except it has an added component of enhanced anaerobic ISB. ISB would involve determining the specific bacteria present in the aquifer soils and groundwater, and if these bacteria are capable

of degrading the COCs. If the bacteria present are not capable of degrading these chemicals, then adding naturally occurring bacteria from another site would be studied. Bench- and pilot-scale tests of different bacteria would be conducted to determine if these bacteria naturally degrade the solvents. When bacteria are added, usually an "electron donor" also needs to be added to the groundwater. Typically, electron donors are food-grade products including emulsified vegetable oil, molasses, or cheese whey. These substances are put into the ground and the bacteria use these as food, which accelerates their growth so there is more bacteria to degrade the solvents.

Mr. Zweifel asked about anaerobic and aerobic processes and which applies to these plumes. It was explained that aerobic or oxygen consuming bacteria would be applied to fuel hydrocarbons and petroleum. For chlorinated solvent sites, anaerobic processes would be used to take all of the oxygen out of the system creating conditions where these types of bacteria would thrive.

Mr. Carroll pointed out that a particular bacteria, *Dehalococcoides ethenogenes,* is often used. DNA testing in the laboratory is commercially available for these bacteria. This testing determines which strains of these bacteria can degrade a particular solvent.

Baseline monitoring is performed before an electron donor such as emulsified vegetable oil is injected into the groundwater. Once the vegetable oil is injected, it will gradually diffuse out and serve as food for these bacteria for 3 to 5 years. The next step is performance monitoring which starts shortly after the injection process is completed. Quarterly sampling would be conducted and a specific schedule would be developed during the remedial design stage. After the 3 to 5 year period, if the cleanup goals have not quite been met, then a switch to MNA would be made to let the natural processes continue to degrade the solvents. The 5-year reviews would be conducted until cleanup goals are achieved.

To better understand how ISB could be implemented, a conceptual design was presented; the example focused on IRP-5S(a). The vegetable oil would be injected at a total of roughly 200 points, in rows about 15 feet apart. About 1 drum of vegetable oil would be injected at each point. To determine an appropriate layout for the injection points, water chemistry, groundwater velocities, and concentrations of the solvents were evaluated. However, this information would be confirmed or modified during the remedial design stage. Two other examples of conceptual designs for ISB at IRP-6 and the MPA were shown to the RAB. At the MPA, there would be 200 injection points in the 1st WBZ and 30 points in the 2nd WBZ at a rate of 1.5 drums of vegetable oil for each injection point. For the much smaller plume at IRP-6, it is estimated there would be approximately 36 injection points and an injection rate of 4.8 drums of vegetable oil per injection point. A higher dose of vegetable oil is estimated due to the sulfate naturally present in the groundwater.

<u>Alternative 5 – ISCO, ISB, MNA and ICs</u> - adds another component beyond Alternative 4. ISCO involves adding a chemical oxidant into the groundwater. It is similar to adding a disinfectant in drinking water. The other components previously described are included in this alternative. ISCO would target areas in groundwater with higher concentrations of VOCs. Bench- and pilot-scale testing would be performed to determine specific characteristics so the bacteria in the environment are not adversely affected when the chemical oxidant is added to the subsurface. This testing rules out some types of chemical oxidants. ISCO chemical agents would be injected in a grid pattern. ISCO performance monitoring would be performed to verify whether this

process worked. ISB would be conducted after ISCO and be performed as described in Alternative 4. MNA would be applied as needed following ISCO and ISB to reach remediation goals. Alternative 5 also includes 5-year reviews and ICs until remediation goals are achieved.

Mr. Dana Ogdon, RAB member representing the City of Tustin, asked if bench- and pilot-scale testing is conducted before the remedy is selected. Mr. Carroll clarified that this testing is included in the remedial design stage after the Record of Decision (ROD). Mr. Ogdon asked what happens if these tests determine that the alternative will not work. Mr. Carroll said these technologies have been applied at numerous sites across the country and they are well established. These tests help determine specific factors, including how far apart injection points need to be and how many gallons of an electron donor are needed at each injection point. Tests also determine which electron donor works best at specific sites and there are a lot of choices available by various vendors. Ms. Arnold explained that all the alternatives presented are feasible and include technologies that do work.

A RAB meeting attendee asked what the difference is between a bench- and a pilot-scale test. Mr. Carroll explained that bench-scale tests are performed in the lab and pilot-scale tests are conducted in the field. Typically, bench-scale tests are conducted on different vegetable oils, molasses, and/or other electron donors to determine biodegradation effectiveness. After one of these is selected, it would be tested in the field in a pilot-scale test. The length of time for a pilot-scale test depends on project schedule but typically these are conducted in 3 to 6 months.

Ms. Norby asked if there are any negative impacts from injecting that much vegetable oil into the groundwater and if residual oil would remain in the groundwater. Mr. Carroll explained that this is a food-grade vegetable oil and it is not toxic. As far as toxic by-products are concerned, there are none. As the bacteria grow, there is some residual left behind and the bacteria create a bio-film. It is possible that the groundwater may not flow as quickly though that area. He explained that through the degradation processes TCE becomes DCE, DCE becomes vinyl chloride, and vinyl chloride eventually becomes ethene and ethane. The chemistry and timing of these processes is well known and this would be tracked. Typically, it takes 5 years or less to cleanup a site using enhanced biodegradation technology.

Mr. Zweifel also expressed concern over the injection of vegetable oil. He asked if it would impede groundwater flow, and if it does, is this a negative impact on the groundwater. Mr. Carroll said that typically deeper groundwater zones are replenished by the shallow groundwater zones and there may be a small impact on the treatment areas but it is doubtful it will affect the regional groundwater aquifer. Alternative 5 is just one of the alternatives that are being evaluated. It was also noted that state and federal maximum contaminant levels (referred to as MCLs) are being used as cleanup criteria in the shallow 1st WBZ but these shallow WBZs are not currently being used to supply groundwater for any use, however, the deeper underlying regional aquifer is. This is important to consider when evaluating the alternatives.

Mr. Ogdon asked how deep would the vegetable oil be injected. Mr. Carroll said it is estimated it would be injected at depths of 20 to 30 feet below the ground surface to the silty sand layers. Mr. Ogdon asked if this treatment option would preclude development at the site. It was explained that injection is a one-time event and the surface would be restored to the same condition before the injection activity. There may be some

groundwater monitoring wellheads that are visible. These wells would be used to monitor the effectiveness of the alternative.

Mr. Chris Crompton, RAB member, said that the groundwater in this area is rich in selenium and he asked if these treatment alternatives would cause a release of selenium into the creeks. He mentioned that groundwater in this area is unique and it flows to Peters Canyon Channel. Local agencies are dealing with total maximum daily loads of selenium and other constituents into local creeks, washes, and drainages.

Mr. Carroll said within the treatment area, the geochemistry of the water would be changed. In reducing conditions where treatment is applied, most metals would come out of solution but only within the treatment zone itself. Once the groundwater moves out to areas that have not been treated, it is restored back to the natural conditions and would be no different than existing groundwater is now. There would be some temporary changes but that would be tracked in the performance monitoring of the alternatives. He explained that selenium typically does not mobilize. Ms. Arnold said the Navy will be working with the regulatory agencies, U.S. EPA, DTSC, and the Water Board, who will review and provide input on the performance monitoring. She added that the Navy is not discharging to Peters Canyon Channel or any other channels.

A conceptual design of Alternative 5 was presented to the RAB. The focus is on the groundwater contamination in the moderate (higher) concentration sites. ISCO would occur first and a few months later ISB would be conducted.

Ms. Norby asked for an explanation of chemical oxidation. Mr. Carroll explained that in the FS, five or six different types of chemical oxidation processes were evaluated. The process that was used for costing purposes in the FS is called “modified-Fenton’s chemistry.” A solution of iron is injected into the groundwater at the same time as low concentrations of hydrogen peroxide; after they mix together in the groundwater, they create a very strong oxidant. The oxidant in the groundwater is looking for hydrocarbons or other organic substances to dissolve. In this example, the solution contains iron and a low concentration of hydrogen peroxide. Typically, the solution is 10 to 12 percent hydrogen peroxide, a little bit stronger than what someone may have at home in their medicine cabinet.

Alternative 6 – Hydraulic Control/MNA/ICs - This alternative is very similar to what has been implemented at OU-1A and OU-1B and would address IRP-5S(a) and the MPA. It is assumed that the system would be continued for 10 years. Hydraulic containment (by groundwater extraction) would be conducted to the point that the plumes are stabilized, and then natural attenuation processes would take over. Extracted groundwater would be conveyed to the existing treatment systems at OU-1A and -1B and treatment would be “piggybacked” onto these systems. The flow rate for extracting groundwater is assumed to be about 3 gallons per minute for each of the three wells. This extraction rate is based on groundwater modeling that indicates it does not take much pumping to control the plumes.

FS Report Summary - The FS Report presents a range of options for consideration. The presentation provided the RAB with a series of slides that presented descriptions of the alternatives developed for the sites and comparative analysis of the alternatives. A summary chart was presented from the FS Report that summarized the comparative analysis of the alternatives (using several criteria) as low, medium, or high. Three categories of criteria were used to evaluate the alternatives. Threshold criteria included

overall protection of human-health and the environment and compliance with applicable, relevant and appropriate requirements (ARARs). Primary balancing criteria included long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost. Modifying criteria including state and community acceptance will be evaluated after comments on the Navy's proposed plan are received. The RAB was informed that the tables in Section 5 of the FS describe how the alternatives were ranked in the evaluation. It also explains what the criteria are. These evaluations are a decision tool for selecting the preferred alternative.

The FS Report does not provide a recommendation. The decision process is the next step and the Proposed Plan that is developed presents the Navy's preferred remedy to the public. The regulatory agencies, the RAB, and the general public are provided an opportunity to have input on the preferred remedy presented in the Proposed Plan. There is a 30-day public comment period on the Proposed Plan and a public meeting is held. At the public meeting, a court reporter is present to record community comments and input. Answers to questions raised by the community at the public meeting are included in the Responsiveness Summary portion of the ROD.

Mr. Crompton asked if there were more than six alternatives evaluated, and if so, was there a pre-screening process applied to get to the six alternatives. Mr. Carroll indicated that before the alternatives were developed, a technology screening was performed for different treatment technologies. The screening process led to the technologies that were combined to develop the remedial alternatives that underwent evaluation in the FS Report.

Mr. Crompton asked if permeable reactive barriers (PRBs) were assessed. Mr. Carroll clarified that PRBs were assessed, specifically ISB which uses vegetable oil but the PRB term was not used in the presentation. PRBs typically refer to the rows of wells where injection occurs. Another permeable reactive technology is zero-valent iron where very high concentrations of contaminants are present such as 10,000 parts per billion (ppb) and it is not intended for contamination in the 20 to 200 ppb range that are present at the OU-4B sites. Table 3-1 in the FS Report lists all the technologies that were considered.

Mr. Crompton asked why ISCO was not evaluated for the MPA site. Mr. Carroll indicated that ISCO is usually done in an area where very high concentrations are present and in the MPA concentrations are about 40 ppb. Concentrations were not high enough to warrant the evaluation of chemical oxidation.

Next Steps for OU-4B - The Technical Memorandum (Tech Memo) for IRP-6 and the MPA is in the process of being finalized. Regulatory agency and City of Tustin comments on the Tech Memo are being addressed. The Tech Memo was a key document in completing the site characterization for the investigation for IRP-6 and the MPA. This document filled the data gaps needed before the alternatives in the FS could be developed. Regulatory agency comments on the OU-4B FS are due on May 31, 2008. After comments are received the Draft Final FS Report will be prepared. It is scheduled for issuance to the regulatory agencies on June 30, 2008.

OU-4B FS Subcommittee

Three RAB members signed up to participate in a subcommittee meeting for the OU-4B FS. Proposed dates for the meeting are May 22 or May 28, 2008. The Navy will coordinate a specific date, time, and location via email.

Future Topics/Schedule Next RAB and Subcommittee Meetings/Meeting Evaluation and Closing

A suggestion for a future RAB meeting presentation topic is an update on all the OUs.

The next RAB meeting is scheduled for August 6, 2008 and will be held at the City of Tustin, Clifton Miller Center. The RAB Community Co-Chair election is planned for the next meeting.

Additional Discussion

Mr. Zweifel asked Mr. Ogdon if the City of Tustin is satisfied with the Navy's remediation efforts. Mr. Ogdon replied that there are occasional differences as indicated in the letters he has written, but the majority of the base has been transferred and the City is very pleased.

Mr. Robert Kopecky, RAB member, representing the South Orange County Community College District, requested information on timelines when property will be transferred to the District. There are approximately 30 acres to be transferred. The Navy's Site Management Plan (SMP) for former MCAS Tustin contains the schedule but it hinges on when the sites remedies are selected, implemented, and achieve OPS status.

Ms. Norby requested a new aerial photo/map be used at RAB meetings that show the former base in its current condition.

Ms. Reynolds requested that the RAB have the opportunity to obtain copies of regulatory agency comments on the OU-4B FS. The Navy informed the RAB that comments would be available on the information table at future RAB meetings.

The May 14, 2008 meeting was adjourned at 8:52 p.m.

List of Handouts Provided at the Meeting

- RAB Meeting Agenda/Public Notice – May 14, 2008 (81st) RAB Meeting.
- Meeting minutes from the February 20, 2008 (80th) RAB Meeting.
- Presentation: *"Revised Draft Feasibility Study for Operable Unit 4B, Former MCAS Tustin",* presented by Jim Callian, PG, Remedial Project Manager and Dan Carroll, PE, Kleinfelder, May 14, 2008.
- Former MCAS Tustin Environmental Program Status, May 2008.
- Map – Figure 1, Carve-Out Areas and Groundwater Plumes, Former MCAS Tustin, May 2008.
- Restoration Advisory Board Fact Sheet/Membership Application.
- Former MCAS Tustin RAB Meeting Schedule: August and November 2008.
- Former MCAS Tustin - Where to Get More Information.
- Former MCAS Tustin Marine Corps/Navy Team Contact Information.
- DTSC Public Participation Specialist Tim Chauvel, Contact Information.
- For More Information: Administrative Record and Information Repository Locations.
- Internet Access – Environmental Web Sites.

- Former MCAS Tustin Installation Restoration Program - Mailing List Coupon.
- Former MCAS Tustin Installation Restoration Program Advisory Board Mission Statement.
- Department of the Navy, "Policy for Conducting Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Statutory Five-Year Reviews," November 2001.
- Department of Defense, "A Guide to Establishing Institutional Controls at Closing Military Installations," February 1998.
- Department of Defense, "Institutional Controls: What Are They and How are They Used," Spring 1997.
- U.S. EPA, "Five-Year Review Process in the Superfund Program," April 2003.
- Memorandum from the Under Secretary of Defense, Subject: Responsibility for Additional Environmental Cleanup After Transfer of Real Property, July 25, 1997.
- Presentation: *"Status Update OU-1A/1B Remedial Action, Former MCAS Tustin"*, presented by Louie Cardinale, Navy BRAC Project Manager and Doug Bielskis, ERRG project Manager, February 20, 2008.

Copies of the meeting minutes and handouts provided at the May 14, 2008 RAB meeting are available at the Information Repository for former MCAS Tustin located at the University of California, Irvine, Main Library, and Government Publications Section. Library hours are 8:00 a.m. to 7:00 p.m. Monday through Thursday; 8:00 a.m. to 5:00 p.m. Friday and Saturday; and 1:00 p.m. to 5:00 p.m. on Sunday. It is recommended, however, that people call the library for confirmation of these hours as they may be modified during final exam and holiday periods. The Government Publications Section may be reached at (949) 824-7362.

Minutes from previous RAB meetings can be found on the internet on the Navy BRAC website: www.bracpmo.navy.mil

Internet Sites

Navy and Marine Corps Internet Access
BRAC PMO Web Site (includes RAB meeting minutes):

Navy web site: http://www.bracpmo.navy.mil/

For Tustin RAB information:
http://www.bracpmo.navy.mil/bracbases/california/tustin/rab_information.aspx

Department of Defense – Environmental Cleanup Home Page Web Site:
http://www.dtic.mil/envirodod/

U.S. EPA:
www.epa.gov (homepage)
www.epa.gov/superfund (Superfund information)
www.epa.gov/ncea (National Center for Environmental Assessment)
www.epa.gov/federalregister (Federal Register Environmental Documents)

Cal/EPA:
www.calepa.ca.gov (homepage)
www.dtsc.ca.gov (Department of Toxic Substances Control)
www.waterboards.ca.gov/santaana (Santa Ana Regional Water Quality Control Board)