



Final FORMER MARINE CORPS AIR STATION (MCAS) Tustin 97th Restoration Advisory Board (RAB) Meeting Summary



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MCAS TUSTIN
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Meeting Location: Tustin Senior Center, 200 South C Street, Tustin, California
Meeting Date/Time: 25 September 2013/ 7:00 PM to 9:00 PM
Summary Prepared by: Erika Marx, Accord MACTEC 8A Joint Venture (AM8AJV)

Attachments:

Presentation Slides:

- Environmental Program Status, Former Marine Corps Air Station Tustin
- Operable Units (OU)-1A and -1B Installation Restoration Program (IRP) Sites 13S, 12, and 3 Groundwater Remedy Status Update

Attendees: Eighteen people attended the RAB meeting:

Navy: Jim Callian, Base Realignment and Closure (BRAC) Environmental Coordinator (BEC) and RAB Co-Chair; Jim Sullivan, incoming BRAC BEC and RAB Co-Chair; and Louie Cardinale, Navy Remedial Project Manager.

Regulatory Agencies: Patricia Hannon, Regional Water Quality Control Board, Santa Ana Region (RWQCB).

RAB Members: Don Zweifel, RAB Community Co-Chair; Matt West; Robert Kopecky, Mary Lynn Norby, and Randy Peebles.

Other Attendees: Tony Guiang, AMEC; Kaleena Johnson, Environ; Erika Marx, Accord Engineering, Inc.; Todd Schmieder, Tait & Associates; Mike Wolff, ECS, Inc.; Dhananjay Rawal, ECS, Inc.; Harry Takach, Pacific States; Desire' Chandler, community member; and Donna Zweifel, community member.

WELCOME/INTRODUCTIONS/AGENDA REVIEW:

Mr. Jim Callian, BEC and Navy RAB Co-Chair, welcomed everyone to this Former MCAS Tustin 97th RAB meeting and thanked everyone for coming.

ANNOUNCEMENTS/ REVIEW OF ACTION ITEMS:

Mr. Callian began the meeting with the following announcements and discussion:

- Mr. Callian initiated self-introductions.
- Mr. Callian announced that Mr. Ram Peddada of the California Department of Toxic Substances Control (DTSC) would not be present at the meeting due to illness. Ms. Susan Reynolds (RAB Member) also had an excused absence from the meeting.

- Mr. Callian summarized the Meeting Agenda. He noted the meeting would begin with Installation Restoration Program [IRP] Environmental Status updates; regulatory agency status updates; RAB membership discussion; and a RAB Co-Chair election.
- Mr. Callian provided Navy and Regulatory Agency contact information and made special note of the contact information for Mr. Jim Sullivan, who will be the new BEC beginning October 1, 2013. Mr. Sullivan provided a brief self-introduction to the RAB. He noted he had originally assumed the role of a BEC at the origin of the BRAC program in 1993. He was the BEC for Treasure Island from 1993 until January 2013. He has also worked on two other bases (Former Department of Defense Housing Facility in Novato and Former Navy Auxiliary Landing Field in Crow's Landing). Mr. Sullivan expressed his eagerness to work closely with everyone on the Former MCAS Tustin RAB. Mr. Callian thanked and welcomed Mr. Sullivan to the Former MCAS Tustin RAB.
- Mr. Callian presented information slides of the Administrative Record File in San Diego and the Information Repository at the UC Irvine campus library. Mr. Callian also presented environmental and reuse/redevelopment websites. He mentioned that the BRAC website is maintained by the Navy and is a very useful tool for viewing key environmental documents.
- Mr. Callian stated that the next semiannual RAB meeting would be held on Wednesday, May 21, 2014; and either on September 25, 2014 or December 10, 2014; depending on what documents would be available at that time.
- Mr. Callian explained that environmental progress of implementing remedies at all of the IRP sites is mature, and all sites except for one are in the long-term monitoring (LTM) phase. Therefore, there will not be much to change on the environmental status updates for these sites over the next few years because of the time it will take to remediate contaminants in groundwater at these sites.
- Mr. Callian presented a slide that summarized the procedure for reviewing RAB Meeting Summaries, which is aimed at expediting the process of finalizing and distributing the Summaries. This procedure involves sending the draft RAB meeting summaries out to the RAB members for their review and comment within approximately 45 days after RAB meetings are held. RAB members have 14 days to provide any comments to the Community Co-Chair, who will then submit them to the Navy. The meeting summary will then be finalized and posted on the BRAC website within 21 days after submittal to the Navy.

ENVIRONMENTAL STATUS UPDATE:

Slide 1 – Presents a brief project history for Operable Unit (OU) 1A - IRP Site 13 South - 1,2,3-trichloropropane (TCP) in groundwater. The next steps for this Site include on-going operation and maintenance (O&M) activities such as inspections, effluent sampling, groundwater monitoring and reporting, and using these data to evaluate and optimize the system. The Final 2012 Annual Performance Evaluation Report (PER) is scheduled to be issued in October 2013. Mr. Donald Zweifel asked if he could have a copy of the Environmental Status Update slides. Mr. Callian responded that he would e-mail him a copy.

Slide 2 – Presents a brief project history for OU 1B - IRP Sites 3 and 12 - trichloroethene (TCE) in groundwater within Carve Out (CO)-5 and CO-6. The next steps for OU-1B are the same as OU-1A.

The slide also outlines a brief project history for OU-3 (IRP Site 1 - Moffett Trenches Landfill) within CO-10 (parcel transferred in 2006). The next steps for OU-3 include LTM, O&M, and reporting. Annual inspections will be performed in October 2013. Groundwater and surface water monitoring will be conducted in Spring 2015 in support of the next Five-Year Review to be completed in October 2016.

Slide 3 – Presents a brief project history for OU-4B - Moderate Concentration Sites: IRP-5S(a) and -6, and the Mingled Plumes Area (MPA); and Low Concentration Sites: IRP-11 and -13W, within CO-2, CO-5, and CO-9.

The next steps for OU-4B Low Concentration Sites IRP-11 and -13W include LTM, O&M, and reporting. The next steps for OU-4B Moderate Concentration Sites IRP-5S(a), -6, and the MPA include In-Situ Bioremediation (ISB) progress groundwater monitoring; issuing a Draft Final Land Use Control (LUC) Remedial Design (RD) and Draft Interim Remedial Action Completion Report (I-RACR) in January 2014.

Slide 4 - Presents a summary of the Final Findings of Suitability to Transfer (FOSTs) and Findings of Suitability to Lease (FOSLs) dates as well as a list of acronyms and abbreviations.

Ms. Mary Lynn Norby (RAB Member) asked Mr. Callian to elaborate on the institutional controls (ICs) implemented at the sites. Mr. Callian responded that ICs are legal and administrative mechanisms such as those included in deeds and covenants, implemented to protect the remedy, human health and the environment, and to prevent or restrict access to groundwater without prior approval from the regulatory agencies and the Navy. As part of this process, yearly inspections are conducted and certifications are issued to ensure that the ICs have been complied with and land use has not changed; and (for example) that no one has applied for permits to install drinking water wells or any other types of wells.

Ms. Norby stated that she would like a list of ICs currently in place at each particular site. Mr. Callian responded that all of the ICs are fairly standard and are in place mainly to prevent the tampering or damage of equipment such as monitoring wells or conveyance pipelines and to ensure that development does not hamper remediation efforts. Mr. Callian also added that the ICs objectives (or land use control objectives) are presented in the Record of Decision (ROD). Specific ICs are then included in the deeds and covenants between the Navy and DTSC and then run with the land.

Ms. Norby asked if a deed restriction would show up on a title report if the land were to be transferred. Mr. Callian confirmed this would occur.

Ms. Norby asked if and when a restriction for a site would ever be removed from a deed. Mr. Callian responded that the restrictions could be lifted once remedial goals are met and the site is closed.

REGULATORY AGENCY UPDATE:

Ms. Patricia Hannon (RWQCB)

Ms. Hannon stated that she has reviewed the following documents since the last meeting: Draft 2012 Annual Monitoring Report for Moffett Trenches IRP 1; Draft 2012 Annual Performance Evaluation Report (PER) for Groundwater Remedy at OU-1A and OU-1B; and the Draft 2012 Annual IC Compliance Monitoring Report for IRP 11 and 13W. She noted the RWQCB had no comments on any of the documents. Ms. Hannon stated she was currently reviewing the 2013 Semiannual Groundwater Monitoring Data Summary for OU-1A and OU-1B.

Mr. Callian stated that he is proud of the quality of the documents that have been produced for Former MCAS Tustin sites. He explained that the normal procedure for reporting is to issue three phases (draft, draft final, and final versions) of a document. However, because of the high quality of documents produced, with regulatory agency concurrence the Navy has been able to streamline the effort and issue documents from draft to final versions, thus saving time.

PRESENTATIONS:

Operable Units (OU)-1A and -1B Installation Restoration Program (IRP) Sites 13S, 12, and 3 Groundwater Remedy Status

Mr. Louie Cardinale (Navy RPM) began with a title slide.

Slide 1 – Title slide.

Slide 2 – Presents an overview of the presentation.

Slide 3 – Presents the remedial action objectives (RAOs). They include reducing concentrations of volatile organic compounds (VOCs) in groundwater, protecting human health and ecological receptors, and implementing appropriate remedial actions to facilitate transfer/reuse of the properties.

Slide 4 - Presents a continuation of the RAOs and focuses on the primary chemicals of concern (COCs) for OU-1A and -1B which include 1,2,3-TCP and TCE. Remediation goals (RGs) for the sites are 0.5 micrograms per liter ($\mu\text{g}/\text{L}$) for 1,2,3-TCP and 5 $\mu\text{g}/\text{L}$ for TCE.

Slide 5 - Presents the remedy components for hydraulic containment with hot-spot removal. These components include groundwater extraction, treatment and performance monitoring. Other components include institutional controls to restrict access to groundwater and to protect the monitoring equipment, and five-year reviews. VOC-impacted soil was also removed from the source areas to optimize the remedy by removing any continuing source of contamination to groundwater; soil was determined to require no further action. The systems began 24/7 operation at OU-1A/-1B North in December 2007 and 24/7 operation at OU-1B South in January 2008. The systems presently operate 24 hours per day seven days per week.

Mr. Don Zweifel (RAB Community Co-chair) asked if the first water-bearing zone (WBZ) is the only WBZ that is contaminated. Mr. Cardinale responded that the plumes in OU-1A occur in both the first and second WBZs. There is also a third WBZ that occurs above the Regional Aquifer that is not impacted. Mr. Cardinale added that all three WBZs are monitored to assure that the Regional Aquifer is not impacted.

Mr. Zweifel asked if the Regional Aquifer is impacted, and Mr. Cardinale responded that it is not.

Mr. Zweifel asked if groundwater samples are being collected from the Regional Aquifer to confirm that it has not been impacted. Mr. Cardinale responded that groundwater samples have not been collected from the Regional Aquifer but are being collected from the third WBZ. Since these groundwater samples from the third WBZ have come back clean, it indicates that the Regional Aquifer is not contaminated. He added that there is a clay layer (an aquitard) between the third WBZ and the Regional Aquifer that acts as a barrier to keep contaminants from migrating downward into the Regional Aquifer.

Mr. Zweifel asked for the depths of each WBZ. Mr. Cardinal responded that the first WBZ is approximately 10-30 ft below ground surface (bgs); the second WBZ is approximately 40-50 feet bgs; the third WBZ is approximately 60-90 feet bgs; and the Regional Aquifer is approximately 100 feet bgs.

Mr. Randy Peebles (RAB Member) asked if there are accessible records that state how much contaminated soil has been removed from these areas. Mr. Cardinale responded that the information could be found in soil removal reports from the 2004 to 2006 timeframe.

Mr. Peebles asked how deep the excavations were for soil removal. Mr. Cardinale responded that the contaminated soil was removed to groundwater level or just below. The excavated area was then backfilled with clean soil.

Slide 6 - Presents a continuation of the remedy components. The extraction conveyance consists of 21 extraction wells, of which 16 are in operation. Mr. Cardinale explained that some of the wells have been placed on standby as part of system optimization measures.

Mr. Zweifel asked if the wells have a good capture ratio. Mr. Cardinale responded that calculations show that capture is 25% greater than what is necessary. A vector mapping computer program also confirms these numbers.

Slide 7 - Presents a map of the OU-1A and OU-1B North System Layout.

Mr. Zweifel asked which wells are pumping the most water. Mr. Cardinale responded that extraction well IS72EX07D is currently pumping the most water.

Mr. Zweifel asked how much water is being pumped through this well. Mr. Cardinale responded that the well is pumping at 9 gallons per minute, which is triple the volume of any of the other wells.

Slide 8 - Presents a map of the OU-1B South System Layout.

Mr. Zweifel asked if OU-1B South is a problem area. Mr. Cardinale responded that this area has significantly higher concentrations of TCE compared to the other sites.

Mr. Zweifel asked which wells are pumping more water. Mr. Cardinale responded the extraction wells in the source area are pumping the most water. Mr. Callian added that hydraulic capture is not uniform; the amount of water being pumped itself is not a good

indicator of effectiveness of capture, it depends on the geologic material and the permeability of the soil. Therefore, water level measurements are taken to ensure that groundwater is flowing directly into the extraction wells. Mr. Cardinale added that vector mapping is also used to determine how well the plume is being captured.

Ms. Norby asked where the contaminated water is pumped to after treatment. Mr. Cardinale responded that the clean treated effluent is discharged to the sanitary sewer system.

Ms. Norby asked if the discharged water has met the acceptable level requirements for COCs. Mr. Cardinale responded that the discharged water has been cleaned to below the RGs.

Ms. Norby asked what happens to the contaminants after they have been extracted from the water. Mr. Cardinale responded that the COCs are captured in the granulated activated carbon (GAC) vessels. Samples are collected quarterly, and at some point there is "breakthrough" of the contaminants. Mr. Callian added that there are a series of GAC vessels and samples are collected at the midpoint. When breakthrough occurs, the first vessel is cleaned and the GAC is replaced. The flow of water is reversed so that the second vessel is now first in line and the vessel with the clean GAC is now the second vessel. This way, there are no contaminants that break through the second vessel therefore the effluent is clean.

Mr. Matt West (RAB Member) added that the reason that the water is discharged to the sanitary sewer system is because of the naturally-occurring element selenium that is present in the groundwater.

Mr. Zweifel asked what happens to the GAC vessels once they are fully saturated. Mr. Cardinale responded that the carbon in the vessels is recycled through a thermal desorption process. He added that when the GAC vessels need to have the GAC replaced, they can either be filled with recycled carbon material or new carbon material. Mr. Callian also noted that coconut shells are a great carbon material for GAC vessels.

Ms. Desire' Chandler asked if building a recharge basin is a viable option. Mr. Cardinale responded that building infiltration trenches and wells was not a good investment for this site.

Mr. Zweifel asked if the infiltration system was costly. Mr. Callian responded that infiltration was evaluated, but it was not found to be suitable because the ground could not absorb water as fast as the groundwater was being pumped. Ms. Chandler added that the area contained too much clay that would not allow sufficient infiltration rates.

Slide 9 - Presents the O&M and LTM components, which include regular inspections, maintenance, and quarterly effluent sampling.

Slide 10 - Presents a continuation of the O&M and LTM components, including semiannual groundwater monitoring and reporting. Mr. Cardinale added that the Semiannual Report is a data summary of the results. The Annual Report is an evaluation of the plume capture and recommends optimization measures.

Mr. Cardinale introduced Mr. Mike Wolff (ECS), who took over for the remainder of the presentation.

Slide 11 - Presents the conclusions of the 2012 Draft Annual PER. Mr. Wolff explained that the hot spots at OU-1A and OU-1B South have been eliminated for two years now. However, this does not mean that the contamination is gone; it means that the statistical value of concentrations that defines a hot spot is not exceeded.

Mr. Zweifel asked if the first WBZ at OU-1B South is still contaminated. Mr. Wolff said that both the first and second WBZs are still contaminated, but the first WBZ still qualifies as a hot spot, which is defined as an area where COC concentrations are statistically much greater than the average concentrations. Concentrations of COCs in the second WBZ has decreased so significantly that there are no longer any hot spots.

Mr. Zweifel asked what is the amount of contamination left in the second WBZ. Mr. Wolff provided the following data in response. He noted that the first WBZ hot spot, in prior years, had as high as approximately 16,000 µg/L, and that maximum concentrations have decreased to approximately 3,600 µg/L. The second WBZ, in prior years, has had maximum concentrations of approximately 7,000 to 9,000 µg/L, and that these have decreased to approximately 2,400 µg/L, which is low enough that there are no longer any hot spots.

Mr. Zweifel asked if Mr. Wolff was referring to OU-1A or OU-1B. Mr. Wolff responded that he is referring to OU-1B South. Mr. Callian added that these hot spots are determined statistically in comparison to the average concentrations in the plume. For example, an area that has two standard deviations higher concentrations than the average concentration in the plume would be considered a hot spot.

Mr. Wolff added that these former hot spots were the locations underneath the source area.

Mr. Zweifel asked if the hot spots are due to former dry cleaning activities on the base. Mr. Wolff responded that the sources of the COCs were due to the former use of cleaning agents and solvents. Mr. Cardinale added that there is still a statistical hot spot at OU-1B South in the first WBZ, but not the second WBZ.

Mr. Wolff explained that the system operation has been at almost 100% runtime, which is very high. He explained that naturally high calcium and sulfate concentrations cause problems for the equipment, and preventative maintenance is required.

Mr. Zweifel asked for the definition of COCs. Mr. Wolff responded that COC stands for "chemical of concern."

Ms. Norby asked if there is an estimate as to when the COC concentrations will decline to the RGs. Mr. Wolff responded that there is no estimate because the cleanup is not linear. The longer the cleanup goes, the more the decreasing concentration trends flatten. Modeling in the original design phase estimated cleanup time on the order of 30 years or more. The remedy has been in place for a little over 5 years at this point. Mr. Callian responded that the ROD anticipated an asymptotic curve as the pumping continues and the plume stabilizes. Once the plume is stabilized, the pumping will stop, the plumes will degrade naturally and will continue to be monitored through the time RGs are reached.

Mr. Zweifel asked if the byproduct of TCE is a carcinogen. Mr. Wolff responded that TCE itself is a carcinogen and it degrades to dichloroethylene (DCE) and then to vinyl chloride, which is a

carcinogen more toxic than TCE. Mr. Wolff continued that vinyl chloride breaks down into ethene, which is a nontoxic end product.

Mr. Callian added that the number of chlorine atoms in these compounds can help explain the degradation process. For example tetrachloroethylene (PCE) contains four chlorine atoms, which then degrades to TCE (three chlorine atoms), then to DCE (two chlorine atoms), then to vinyl chloride (one chlorine atom). Mr. Wolff added that during the degradation process, each chlorine molecule that is removed is replaced by a hydrogen atom. When all chlorine atoms are removed, the end product is ethene, which is two hydrogen atoms bonded together. Ethene is nontoxic and is the end product.

Slide 12 - Presents a figure of the OU-1B North plume capture in the first WBZ. Mr. Wolff explained that this is an example of a gradient vector map. Each arrow is a vector that shows the direction of groundwater flow, based on computer modeling with inputs of water levels measured in monitoring wells. Each line in the figure represents an elevation level contour. The figure shows that the extraction wells are located in a depressed area; therefore, contaminants are captured as they flow toward the extraction wells.

Mr. Zweifel asked if the extraction wells were at 50 feet bgs. Mr. Wolff responded that they are located in the upper 10-30 feet bgs (the first WBZ).

Slide 13 - Provides the recommendations in the 2012 Draft Annual PER. These include considering further optimization of TCE mass removal at OU-1B South and substituting sampling of idle extraction wells with nearby observation wells.

Mr. Zweifel asked what the differences are between an observation well and a monitoring well. Mr. Wolff responded that in this case, they are the same. Observation wells are typically designed only to measure water levels and are sometimes too small in diameter to collect samples from. These particular observation wells have two-inch diameter casings so that proper sampling equipment can fit down the well. Some wells are screened across both the first and second WBZs. In this case, the first and second WBZs are targeted individually with shorter screens.

Mr. Zweifel asked for the length of the screens. Mr. Wolff responded that the screens are approximately ten feet from the top of the screen to the bottom of the screen and that they measure discrete intervals. Instead of sampling the long-screened extraction wells, the sampling will be from the short-screened observation wells.

Mr. Zweifel asked for the width of the screens. Mr. Wolff responded that the screens are two inches in diameter with slots that are 0.02 inches.

Mr. Zweifel asked if the screens ever become clogged. Mr. Wolff responded that this happens periodically at OU-1B South and that these wells require occasional maintenance.

Mr. Zweifel asked if maintenance includes flushing the wells with Purex. Mr. Wolff responded that there are no foreign materials put into the well. Maintenance includes surging, bailing, and pumping the wells with greater intensity than normal to remove sediment build-up and bring the wells back to proper performance.

Mr. Zweifel asked if there are problems with algae in the wells. Mr. Wolff responded that algae does not present a problem; however, iron rust and calcium sulfate do. Mr. Wolff explained that calcium sulfate is gypsum, which presents more of a problem in the carbon vessels than in the wells themselves.

Slide 14 - Presents an overview of the regulatory comments. Regional Board concurred with the Report recommendations and US EPA responded with a no comment letter. DTSC issued a letter dated July 22, 2013 with several technical comments. Mr. Wolff addressed the second comment, which requested additional discussion of specific standby wells. Mr. Wolff explained that as the concentrations of COCs in the plumes are reduced, it reduces the need for pumping from some of the extraction wells. Because it is wasteful and not sustainable practice to pump wells unnecessarily, an integral part of the optimization process is to get the job done with the least amount of resources, electricity, etc. The design of the system incorporates many sustainability features; such as variable speed motors on all of the pumps.

Mr. Zweifel asked why the Navy has not responded to DTSC's letter regarding the technical comments dated July 22, 2013. Mr. Callian responded that the Navy is in the process of responding to comments and will send out the response shortly. Mr. Zweifel stated that he would like a copy. Mr. Callian responded that he would provide Mr. Zweifel with a copy. Mr. Callian added that all comments and responses to comments are always provided in the appendices of reports.

Slide 15 - Presents a continuation of the overview of regulatory comments. The first bullet addressed the need for verifying capture zones with vector mapping. Mr. Wolff responded that vector mapping is currently being used. Mr. Cardinale added that vector mapping has been used for the past four years. Mr. Wolff explained that there are always two independent methods of capture and evaluation that are used to cross-reference each other.

Mr. Wolff addressed the second comment, which addressed the need for balancing capture versus mass removal. Mr. Wolff explained that this is the goal of the optimization approach.

Slide 16 - Lists the next steps and schedule.

Mr. Zweifel asked if the laboratory analyses are performed by an on-site or off-site laboratory. Mr. Wolff responded that the samples are sent to an off-site laboratory. Mr. Wolff explained that the Navy requires very stringent laboratory analytical standards, and the laboratory must be certified for these standards. The results are then sent to a third-party independent data validation company.

Mr. Zweifel commented that he is very impressed with the work that the Navy has done with these sites.

Ms. Norby inquired about the methods that will be used for the optimization of the extraction well system in OU-1B South. Mr. Wolff responded that one method is to change the pumping rates, but this method has already been fully optimized. Another method that may be considered would be to use an ISB process in the hot spot area to remediate the mass more rapidly.

Ms. Norby asked if there would be any more soil removal. Mr. Wolff responded that there will not be, as the contaminated source area soil was already removed in that area. The Navy will complete a Work Plan with the proposed options and send it to the regulatory agencies for their consideration.

Mr. Todd Schmieder stated that there was very little discussion on OU-1B North. Mr. Wolff explained that OU-1B North is solidly contained. The latest readings of TCE concentrations are mostly only slightly above the RGs. Mr. Wolff stated that if the pumps were to be shut off right now, the plume would be stable and natural attenuation would take over. Overall concentrations of COCs have declined significantly and OU-1B North is very close to achieving RAOs. Because concentrations are so low throughout the plume, there is still a statistical hotspot. However, the concentration has declined significantly and is now well below 100 µg/L. Mr. Wolff stated that OU-1B North is a good example of a plume that is cleaning up ahead of schedule.

Mr. Zweifel commented he is concerned that under residential exposure scenario, the estimated maximum cancer risk for OU-1B South exceeds the acceptable threshold of 1 on the hazard index. Mr. Callian responded that the reason that ICs are implemented is to protect against exposure to the groundwater. The Navy cannot implement ICs if they are not required. In this case, the hazard index (representing non-carcinogenic risk) substantiates the need for ICs.

Mr. Zweifel stated that Irvine Company is currently building high-density apartment housing, and he asked if the land being built upon is cleaned up to the point of a "dirt-eating kid". Mr. Wolff responded that the hazard index numbers Mr. Zweifel referred to are only for vapor intrusion as the pathway and the ICs that Mr. Callian mentioned are specifically targeted for vapor intrusion. Mr. Callian added that the Irvine Company is not building any residences over plumes.

Mr. Zweifel asked how many acres have deed restrictions or ICs. Mr. Callian responded that there are two or three carve outs that have interim ICs implemented by the Navy until the property is transferred. At the time of transfer, the deeds will have ICs that run with the land until the RGs are achieved. Mr. Callian estimated that the total amount acreage is a couple-hundred acres. All the carve outs will have deed restrictions where necessary.

Ms. Norby asked if there are properties that have already transferred that have deed restrictions and ICs. Mr. Callian responded that there are no deed restrictions. Mr. West corrected Mr. Callian and stated that Moffett Trenches (IRP Site 1) has been transferred with deed restrictions and ICs. [There are also ICs in the form of governmental controls at OU-4B; for example, the well permitting program through the Orange County Health Care Agency]

Ms. Norby inquired about the gas station in the District. Mr. Callian responded that the plume is completely within the Carve Out, so there are no deed restrictions outside of the Carve Out for IRP-6. ICs inside the Carve Out area will be implemented through the deed and property transfer documents until the plume is remediated.

Mr. Schmieder stated that there are deed restrictions in the development area along Edinger Blvd. Mr. West stated that this is IRP-13W and that it is part of an early transfer parcel that still has deed restrictions [a portion of IRP-13S in the early transfer parcel also has deed restrictions].

Mr. Callian explained that these deed restrictions state that no one can tamper or interfere with the groundwater remediation equipment, and anyone who wants use or contact groundwater needs to have prior regulatory agency and Navy approval.

Ms. Norby stated that the area does not seem to be very well controlled in terms of having people adhere to the ICs. Ms. Chandler responded that if anyone tries to get a loan to build on that land, the banks would not allow it. Mr. Cardinale also added that using groundwater as a potable water source would be the highest risk to human health. The Orange County Health Care Agency would not approve any permits for well installation at a site with impacted groundwater or these deed restrictions and ICs.

Slide 17 - Presents a list of acronyms.

Mr. Callian thanked Mr. Cardinale and Mr. Wolff for their presentation.

RAB MEMBERSHIP LIST UPDATE:

Mr. Callian presented slides for the RAB membership requirements and responsibilities; and for the RAB membership list update. Mr. Callian stated that there are currently 14 RAB members on record, of which 7 have not regularly attended. Mr. Callian read off a list of names of people who are not currently active with the RAB. These include:

- Dana Ogdon
- Kristin Stout
- Sam Abu-Shaban
- Mike Fernandez
- Daniel Flynn
- Adrian Morton
- Gerry Kirchgessner

Ms. Norby stated that people who have been with the RAB for a long time, such as Adrian Morton and Gerry Kirchgessner, should not be removed from membership and should still receive the RAB mailers. Mr. Callian responded that he did not indicate that these people would not receive mailers anymore; rather he stated that these people would only be removed from the RAB membership roster.

Mr. West stated that while he does not want to speak for Mr. Dana Ogdon, Mr. Ogdon still works for the City of Tustin, and if he wanted to participate in these meetings he would have made that known. Mr. West added that Mr. Ogdon has not attended the RAB meetings in quite a while.

Ms. Norby stated that she was not aware that the RAB membership list was to be updated at tonight's meeting. Mr. Callian responded that RAB membership discussion was listed on the agenda.

Mr. Callian mentioned that there is a provision in the Tustin RAB Charter that states a retiring RAB member may nominate another person in his or her place.

Ms. Norby asked if there is a letter that goes out to these members that informs them of their status with the RAB. Mr. Callian stated that all RAB members received a notice in the last mailer regarding their membership status and to respond if they want to continue being a member of the RAB. Mr. Callian read the letter that was sent in the mailer.

Ms. Norby corrected her former statement that she was not notified.

Mr. Callian asked if there was a motion to remove these members from the RAB. After receiving the motion, Mr. Zweifel called for a vote. The motion passed four to one in favor of removing the RAB members identified by Mr. Callian.

Mr. Callian stated that there were two new membership applications for the RAB; Ms. Desire' Chandler, a previous Tustin BEC, sent in her application indicating her willingness for a minimum two-year membership with the RAB. Mr. Callian read Ms. Chandler's responses to the membership questionnaire.

Mr. Zweifel called for a vote on Ms. Chandler's RAB membership. The RAB Community Members voted unanimously to accept Ms. Chandler as a RAB Member. Everyone welcomed Ms. Chandler as a new member of the RAB.

Mr. Callian also stated that he received a second application from Mr. Nathan Menard, who was not present at tonight's meeting. Mr. Callian read Mr. Menard's responses to the membership questionnaire. Mr. Zweifel asked Mr. West if he knew Mr. Menard and could speak of his character. Mr. West said that he could not, as he did not know Mr. Menard well enough. Mr. Zweifel asked for a vote in favor of delaying the vote until the next RAB meeting. The vote was passed unanimously.

RAB COMMUNITY CO-CHAIR ELECTION:

Mr. Callian presented a slide addressing the Community Co-Chair responsibilities. Ms. Norby asked if these are new responsibilities. Mr. Callian responded that the responsibilities are excerpted from the Tustin RAB Charter. Ms. Norby asked if they are paraphrased. Mr. Callian responded that they are quoted, not paraphrased.

Mr. Callian asked for nominations for the Community Co-Chair. Ms. Norby nominated Ms. Chandler to be the Community Co-Chair. Ms. Chandler accepted the nomination, and the floor was closed for nominations. Mr. Callian then called for a vote to elect Ms. Chandler in as the new Community Co-Chair, and the vote was unanimously in favor. Everyone welcomed Ms. Chandler as the new RAB Community Co-Chair.

MEETING EVALUATION AND CLOSING:

Mr. Zweifel thanked Mr. Wolff and Mr. Dhananjay Rawal for their work.

Mr. Callian asked for topic suggestions for the next meeting.

Ms. Chandler asked what document would be issued next. Mr. Callian responded that it will be the Final Groundwater Monitoring Summary for OU-1A and OU-1B.

Mr. Schmieder requested an update on the status for the Mingled Plumes Area and a discussion or presentation on the ICs for vapor intrusion. Mr. Callian agreed to consider these suggestions.

Mr. Zweifel added that he would like to see an update on the responses to comments for the DTSC technical comments, and Mr. Callian agreed to consider this request.

Mr. Callian noted that he would like to get Ms. Chandler's contact information. Mr. Robert Kopecky (RAB Member) asked that Mr. Menard's contact information be made available as well.

Mr. Callian closed by saying that it has been his distinct pleasure working with this group of highly professional engineers and geologists in his past five years as a BEC. He has been the BEC for both the Former MCAS Tustin and Former MCAS El Toro and he explained that the cleanup and transfer at these former bases is far ahead of most BRAC sites countrywide. Mr. Callian thanked everyone for their participation in the RAB. Applause for Mr. Callian followed.

Mr. Peebles thanked Mr. Zweifel for his service as the Community Co-Chair for so many years. Mr. Callian also thanked Mr. Zweifel and noted that Mr. Zweifel has been the Community Co-Chair for ten years for the Former MCAS Tustin, and has also been associated with the Former MCAS El Toro site as well. Applause for Mr. Zweifel followed.

Mr. Zweifel asked Mr. Callian if he would continue to be the BEC for the Former MCAS El Toro. Mr. Callian responded that Mr. Sullivan would be the new BEC for the Former MCAS El Toro. Mr. Zweifel asked if Mr. Callian would continue to be the BEC for the Former Long Beach Naval Base. Mr. Callian responded that he would continue to be the BEC for a transition period.

The RAB meeting adjourned at 9:00 PM.

LIST OF HANDOUTS PROVIDED AT THE MEETING:

- 25 September 2013 Former MCAS Tustin RAB Meeting Agenda
- Public Notice for the 25 September 2013 RAB Meeting
- Final RAB Meeting Summary from the May 22, 2013 meeting
- Map of Former MCAS Tustin
- Presentation Slides: "Environmental Program Status, Former Marine Corps Air Station Tustin," "Operable Units (OU)-1A and -1B Installation Restoration Program (IRP) Sites 13S, 12, and 3 Groundwater Remedy Status"
- Environmental Websites
- Points-of-Contact
- Former MCAS Tustin RAB Mission Statement and Operating Procedures
- Former MCAS Tustin RAB Fact Sheet/Membership Application
- Former MCAS Tustin Mailing List Coupon

Copies of the meeting summary and handouts are available at the IR for Former MCAS Tustin located in the Government Publication Section of the University of California, Ayala Science Library in Irvine, California. Library hours are 10:00 AM to 8:00 PM Monday through Thursday; 10:00 AM to 5:00 PM Friday; and 1:00 PM to 5:00 PM on Saturday and Sunday. The library phone number is (949) 824-7362 or (949) 824-6836. Copies of the meeting summary and handouts are also available at the CERCLA AR File.

Final meeting summaries from previous RAB meetings can be found on the internet at the Navy BRAC Program Management Office (PMO) website: www.bracpmo.navy.mil.

INTERNET SITES:

Navy and Marine Corps Internet Access:

BRAC PMO Web Site (includes RAB meeting summary): <http://www.bracpmo.navy.mil/>

Department of Defense - Environmental Cleanup Home Page Web Site:

Homepage: <http://www.dtic.mil/envirodod/>

U.S. EPA:

Homepage: www.epa.gov

Superfund information: www.epa.gov/superfund

National Center for Environmental Assessment: www.epa.gov/ncea

Federal Register Environmental Documents: www.epa.gov/federalregister

California Agencies:

California Environmental Protection Agency Homepage: www.calepa.ca.gov

DTSC: www.dtsc.ca.gov

Department of Health Services: www.cdph.ca.gov

Santa Ana RWQCB: www.waterboards.ca.gov/santaana

Additional Websites: Reuse and Redevelopment

Orange County Great Park: www.ocgp.org

Great Park Conservancy: www.orangecountygreatpark.org



SEPTEMBER 25, 2013

ENVIRONMENTAL PROGRAM STATUS FORMER MARINE CORPS AIR STATION TUSTIN



Operable Unit (OU)-1A (Installation Restoration Program Site 13 South [IRP-13S]) – 1,2,3-Trichloropropane [TCP] in Groundwater (GW) within Carve-Out: (CO)-5

Brief Project History:

- 2002: Time-Critical Removal Action (Hydraulic Containment)
- 2004: Final Record of Decision (ROD): Remedy includes:
 - Hydraulic containment of 1,2,3-TCP-impacted GW; and Institutional Controls (ICs)
 - Hot-spot soil excavation to enhance the GW remedy
- 2007 Implement Final Remedial Design (RD) and Remedial Action (RA) Work Plan
- Dec 2007: Treatment system operational
- Jul/Oct/Dec 2008: 1st to 3rd Quarter 2008 GW Monitoring Data Summaries (MDSs)
- Dec 2008: Final Interim-Remedial Action Completion Report (I-RACR);
 - Purpose of the I-RACR is to document that the remedy is constructed per the Final RD
- Jul/Oct/Dec 2009: 1st to 3rd Quarter 2009 GW MDSs
- Sep 2009: Final Long-Term Operation and Maintenance Plan (OMP)
- Feb 2010: Final 2008 Annual OU-1A/-1B Performance Evaluation Report (PER)
- Dec 2009: Obtained U.S. EPA Operating Properly and Successfully “OPS” Designation
- Feb 2010: Final OPS Report
- Jul/Sep/Dec 2010: 1st to 3rd Quarter 2010 GW MDSs
- Nov 2010: Final 2009 Annual OU-1A and -1B PER
- Sep/Dec 2011: 2011 Semiannual GW MDS and 3rd Quarter 2011 GW MDS
- Nov 2011: Final 2010 Annual PER
- Apr/Sep 2012: 1st Quarter and Final 2012 Semiannual GW MDS
- Dec 2012: 3rd Quarter 2012 GW MDS
- Dec 2012: Final 2011 Annual PER
- **Jun 2013: Draft 2012 Annual PER**
- **Sep 2013: Final 2013 Semiannual GW MDS**

Current Status: Long-Term Monitoring/Operation & Maintenance, & Reporting:

- **On-going activities include: biweekly, monthly, & quarterly inspections & effluent sampling; semiannual GW monitoring & reporting; data used to track system performance & annually evaluate & optimize the system**
- **Oct 2013: Final 2012 Annual PER**



SEPTEMBER 25, 2013
**ENVIRONMENTAL PROGRAM STATUS
FORMER MARINE CORPS AIR STATION TUSTIN**



OU-1B (IRP-3 and -12 – Trichloroethene [TCE] in GW) within CO-5 and -6

Brief Project History:

- 2004: Final ROD: Selected remedy includes:
 - Hydraulic containment of TCE-impacted GW and ICs;
 - Hot-spot soil excavation also conducted to enhance the GW remedy
- 2007: Implement Final RD/RA Work Plan
- Jan 2008: Treatment system operational
- Jul/Oct/Dec 2008: 1st to 3rd Quarter 2008 GW MDSs
- Dec 2008: Final I-RACR.
- Jul/Oct/Dec 2009: 1st to 3rd Quarter 2009 GW MDSs
- Sep 2009: Final Long-Term OMP
- Feb 2010: Final 2008 Annual OU-1A/-1B PER
- Dec 2009: Obtained U.S. EPA OPS Designation
- Feb 2010: Final OPS Report
- Subsequent milestones same as for OU-1A Project History above

Current Status: Same as for OU-1A above

**Operable Unit 3 (IRP-1 – Moffett Trenches Landfill) within CO-10 –
PARCEL TRANSFERRED IN 2006**

Brief Project History:

- Dec 2001: Final ROD
- May 2003: Final OMP
- Nov 2003: Final OPS Report
- Mar 2004: Obtained U.S. EPA OPS designation
- Oct 2006: Final First Five-Year Review Report
- Jan 2010: Final 2008 Annual GW Monitoring Report
- Feb 2011: Final 2009 Annual Long-Term Monitoring (LTM) Report
- Jul 2011: Final 2010 Annual LTM Report
- Sep 2012: Final 2011 Annual LTM Report
- **Jul 2013: Final 2012 Annual LTM Report**

Current Status: Long-Term Monitoring/Operation & Maintenance, & Reporting:

- **Annual Inspections (Oct 2013)**
- **GW and Surface Water Monitoring (Spring 2015) in Support of the Next Five-Year Review (Oct 2016)**



SEPTEMBER 25, 2013

ENVIRONMENTAL PROGRAM STATUS FORMER MARINE CORPS AIR STATION TUSTIN



Operable Unit 4B

Moderate Concentration Sites: IRP-5S(a), -6, and the Mingled Plumes Area (MPA)

Low Concentration Sites (IRP-11, -13W, and Miscellaneous Major Spill 4 (MMS-04) within CO-2, CO-5, and CO-9.

Brief Project History:

- 2004: Final OU-4 Tech Memo for 2003 shallow GW investigation
- 2005-2006: GW Monitoring
- Sep 2008: Final Tech Memo for Supplemental GW Investigation at IRP-6 and the MPA
- Oct 2008: Final Feasibility Study Report
- Feb 2009: Proposed Plan, Public comment period: Feb 4 to Mar 06, 2009
- May 2009: Final Work Plan for GW Monitoring at OU-4B Sites
- Jan 2010: 3rd Quarter 2009 Data Summary Report
- Jan/Apr 2010: Final ROD and Replacement Pages for the Final ROD
- Jul to Oct. 2010: Completed Work Plan and Conducted Pre-RD Pilot Study
- Oct 2010: Final 2009 Annual GW Monitoring Report
- Oct/Nov 2010: Final 1st and 2nd Quarter 2010 GW MDS
- May 2011: Final Pre-RD Pilot Study Report
- May 2011: Final 2010 Annual GW Monitoring Report
- Jun 2011: Final RACR for MMS-04
- Aug 2011: Draft Land Use Control (LUC) RD & Long-Term OMP (Low Conc. Sites: IRP-11 & -13W)
- Sep 2011: Final 1st and 2nd Quarter 2011 GW MDS
- Mar 2012: Final 3rd and 4th Quarter 2011 GW MDS
- Nov 2012: Final LUC RD & Long-Term OMP (Low Conc. Sites: IRP-11 & -13W)
- Dec 2012: Final RD/RA Work Plan for Mod. Conc. Sites
- Dec 2012: Final Fact Sheet for Implementing OU-4B Remedial Action
- Jan 2013: 1st Annual Monitoring event at Low Conc. Sites
- Jan to Mar 2013: Completed In-Situ Injections at Mod. Conc. Sites
- **Jun/Sep 2013: 1st and 3rd Quarter Post-Injection Progress Monitoring events**
- **Jul 2013: OPS Letter Request for Low Conc. Sites**
- **Sep/Oct 2013: Draft Annual Institutional Control Compliance Monitoring Report**

Current Status:

- **Low Conc. Sites IRP-11 and -13W:**
 - **Long-Term Monitoring/Operation & Maintenance, & Reporting**
- **Mod. Conc. Sites IRP-5S(a), -6, and the MPA:**
 - **In Situ Bioremediation (ISB) Progress Groundwater Monitoring**
 - **January 2014: Draft Final LUC RD**
 - **January 2014: Draft I-RACR**



SEPTEMBER 25, 2013
ENVIRONMENTAL PROGRAM STATUS
FORMER MARINE CORPS AIR STATION TUSTIN



Final FOST Summary

FOST #1 signed August 29, 2001	Parcels 3, 21, 38, 39 and portions of 40
FOST #2 signed September 28, 2001	Parcels 4-8, 10-12, 14, 25, 26, 30-33, 37, 42 and portions of 40 and 41
FOST #3 signed April 22, 2002	Parcels 23, 29, 34, 35 and 36, and portions of 1, 16, 17, 24, 27, 28, 40 and 41
FOST #4 signed September 26, 2002	Portions of 24 (PS clean area in CO-5)
FOST #5 signed December 17, 2002	COs 8 and 11
FOST #6 signed September 29, 2004	CO-10 and portion of CO-5
FOST #7 signed May 20, 2005	COs 3 and 7 and portion of CO-5
FOST #8 signed February 2006	COs 1 and 4

Final FOSL Summary

FOSL #2 signed February 28, 2002	COs 1 thru 4
FOSL #3 signed April 26, 2002	COs 5 thru 11

Acronyms/Abbreviations

<p>AS/SVE – Air Sparge/Soil Vapor Extraction AST – Aboveground Storage Tank AOC – Area of Concern BCT – BRAC Cleanup Team (Navy, U.S. EPA, DTSC, and RWQCB) Cal/EPA – California Environmental Protection Agency CO – Carve-Out area Conc. - Concentration DCE – Dichloroethene FOSL – Finding of Suitability to Lease FOST – Finding of Suitability to Transfer ICs – Institutional Controls I-RACR – Interim Remedial Action Complete Report IRP – Installation Restoration Program ISB – In Situ Bioremediation LTM – Long-Term Monitoring LUC – Land Use Control MDS – Monitoring Data Summary MMS – Miscellaneous Major Spill MNA – Monitored Natural Attenuation MPA – Mingled Plumes Area O&M – Operation and Maintenance</p>	<p>OCSD – Orange County Sanitation District OMP – Operation and Maintenance Plan OPS – Operating Properly and Successfully OU – Operable Unit PCAP – Petroleum Corrective Action Plan PER – Performance Evaluation Report PS – Public Sale Parcel RA – Remedial Action RAP – Remedial Action Plan RD – Remedial Design ROD – Record of Decision RWQCB – California Regional Water Quality Control Board, Santa Ana Region TCE – Trichloroethene TCP – Trichloropropane ug/L – micrograms per liter U.S. EPA – United States Environmental Protection Agency UST – Underground Storage Tank VOC – Volatile Organic Compound WBZ – Water Bearing Zone</p>
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Operable Units (OU)-1A and -1B Installation Restoration Program (IRP) Sites 13S, 12, and 3 Groundwater Remedy Status Update

**Former Marine Corps Air Station (MCAS) Tustin, California
Restoration Advisory Board (RAB) Meeting**

September 25, 2013

**Louie Cardinale, P.E. – Navy Remedial Project Manager
Michael Wolff, P.G., C.E.G. – Enviro Compliance Solutions**



Presentation Overview



- **Remedial Action Objectives (RAOs)**
- **Remedy Components**
- **Operation and Maintenance (O&M)/Long-Term Monitoring (LTM)**
- **2012 Draft Annual Performance Monitoring Report**
 - **Conclusions**
 - **Recommendations**
 - **Overview of Regulatory Agency Comments**
- **Next Steps / Schedule**
- **Acronyms**



Remedial Action Objectives (RAOs)



- **Reduce concentrations of volatile organic compounds (VOCs) in groundwater to levels consistent with remediation goals (RGs), or until the plumes have stabilized, and prevent or limit VOC migration beyond the current plume boundaries.**
- **Protect human health by preventing extraction of VOC-impacted shallow groundwater for domestic use until RGs are achieved.**
- **Protect ecological receptors in Peters Canyon Channel and Barranca Channel by preventing the off-station migration of groundwater that contains VOCs at concentrations exceeding site RGs.**
- **Implement appropriate remedial actions as necessary to facilitate the transfer and reuse of the properties.**



RAOs (cont.)



Primary Chemicals of Concern (COCs)

OU-1A (IRP-13S)

- 1,2,3-trichloropropane (TCP)
- Trichloroethene (TCE)

OU-1B North (IRP-12)

- TCE

OU-1B South (IRP-3)

- TCE

Remediation Goals (RGs):

- 1,2,3-TCP = 0.5 micrograms per liter ($\mu\text{g/L}$)
- TCE = 5 $\mu\text{g/L}$



Remedy Components



Hydraulic Containment with Hot-Spot Removal

- **Groundwater extraction, treatment, and performance monitoring systems**
- **Soil removal to optimize the remedy**
- **Institutional Controls (ICs)**
- **Five-Year Reviews**

Fully Operational:

- **OU-1A/-1B North: December 7, 2007**
- **OU-1B South: January 2, 2008**



Remedy Components (cont.)



Remediation System Components:

➤ Extraction Systems

- 21 extraction wells (EWs) (15 operating)
 - 9 @ OU-1A (6 operating)
 - 4 @ OU-1B North (3 operating)
 - 8 @ OU-1B South (6 operating)

➤ Conveyance Systems

- High-density polyethylene piping and underground junction boxes

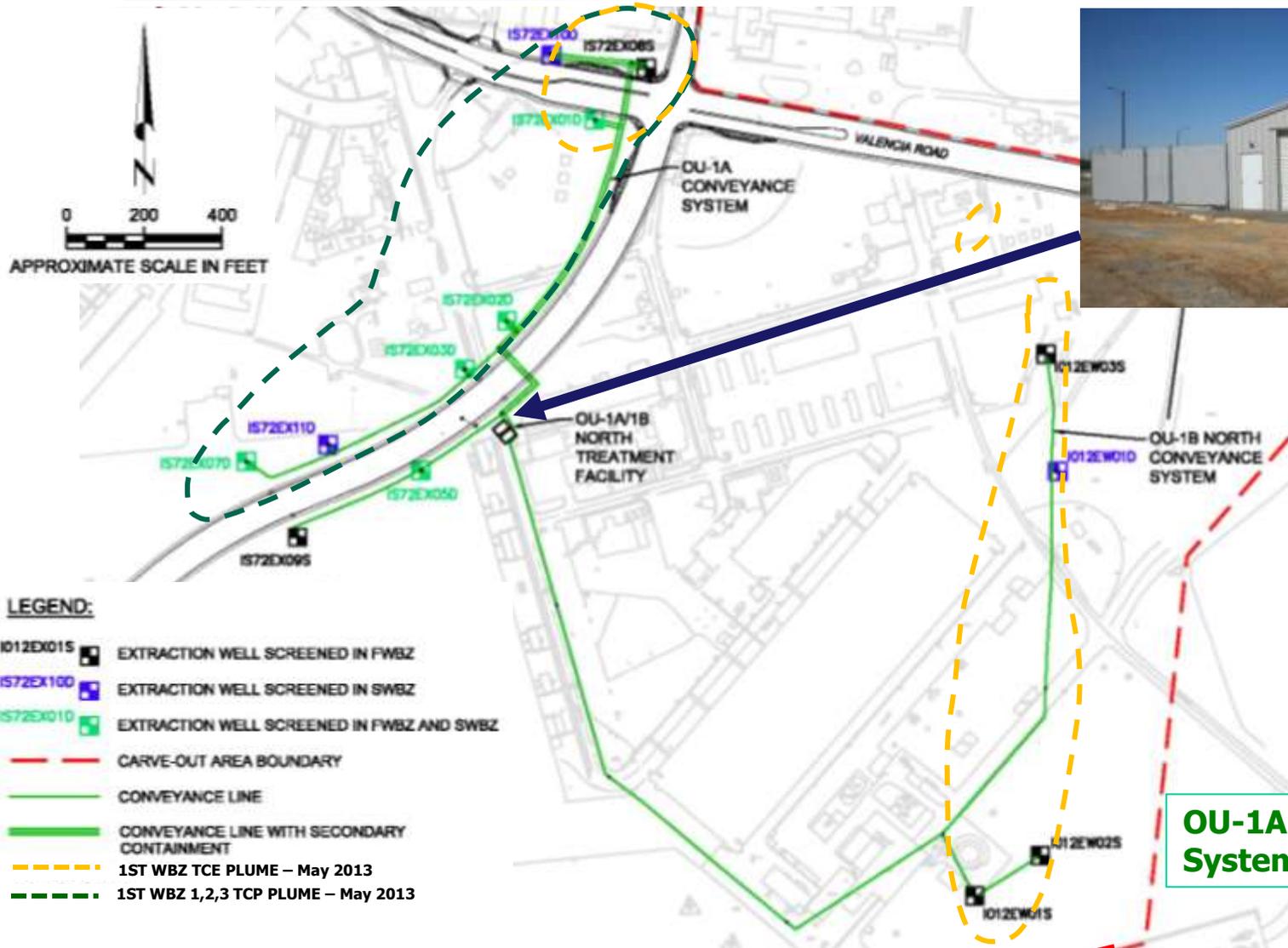
➤ Treatment systems

- Process equipment: holding tank, feed pump, bag filters, and granulated activated carbon (GAC) vessels
- Control equipment: level sensors, pressure gauges, master control and alarm panel, and communication system





Remedy Components (cont.)



OU-1A/-1B North System Layout



Remedy Components (cont.)

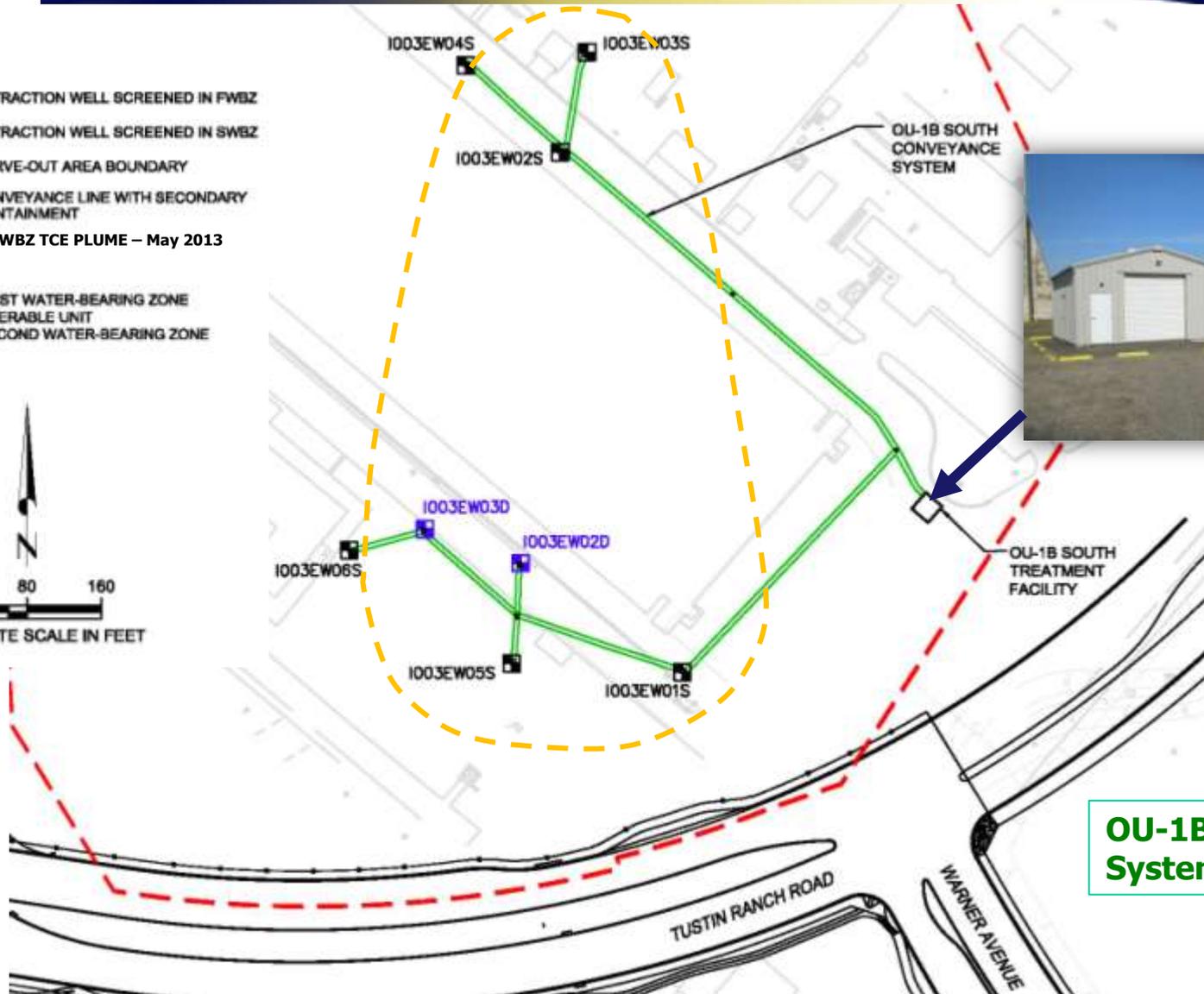
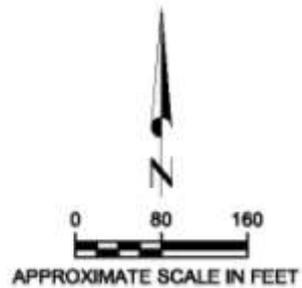


LEGEND:

- 1003EW06S EXTRACTION WELL SCREENED IN FWBZ
- 1003EW03D EXTRACTION WELL SCREENED IN SWBZ
- CARVE-OUT AREA BOUNDARY
- CONVEYANCE LINE WITH SECONDARY CONTAINMENT
- 1ST WBZ TCE PLUME – May 2013

ACRONYMS:

- FWBZ FIRST WATER-BEARING ZONE
- OU OPERABLE UNIT
- SWBZ SECOND WATER-BEARING ZONE



OU-1B South System Layout



Operation and Maintenance (O&M)/ Long-Term Monitoring (LTM)



Regular Inspections and Maintenance of Remedy Components:

- **Biweekly**
- **Monthly**
- **Quarterly:**
 - **Effluent sampling to verify compliance with Orange County Sanitation District (OCSD) discharge requirements**



O&M / LTM (cont.)



Semiannual Groundwater Monitoring and Reporting:

- **Water level measurements (148 wells) to track groundwater flow directions**
- **Groundwater sampling (36 wells) to track plumes**
- **Groundwater sampling at 15 EWs to track system performance**

Data are used to:

- **Evaluate plume capture**
- **Optimize the extraction systems and monitoring well network**



2012 Draft Annual Performance Evaluation Report



Conclusions:

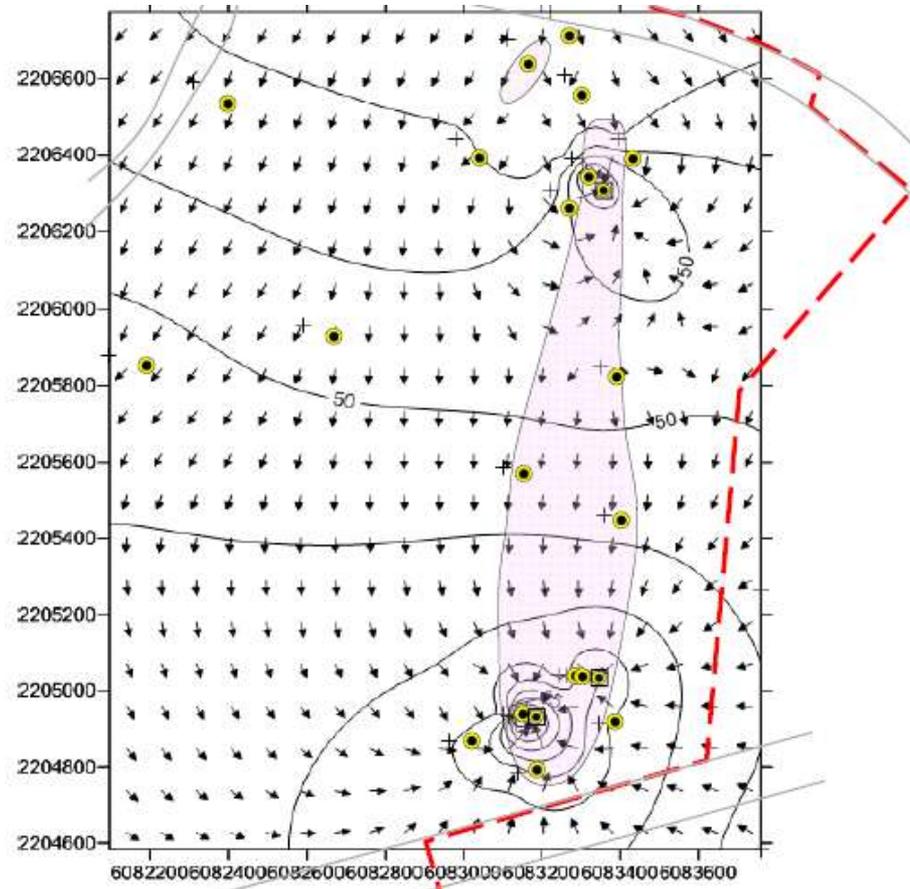
- **Hot spots at OU-1A (1st and 2nd WBZs) and OU-1B South (2nd WBZ) have been eliminated**
- **ICs continue to be protective**
- **System operated at nearly 100% runtime**
- **All plumes continue to be hydraulically contained**
- **COC concentrations are declining toward RGs**



2012 Draft Annual Performance Evaluation Report (cont.)



OU-1B North Plume Capture First WBZ





2012 Draft Annual Performance Evaluation Report (cont.)



Recommendations:

- **Consider further optimization of TCE mass removal at OU-1B South.**
- **Substitute sampling of idle extraction wells with nearby observation wells**



Overview of Regulatory Comments



- **RWQCB – Concurred with the Report recommendations (July 31, 2013)**
- **U.S. EPA – Responded with no comment (August 8, 2013)**
- **DTSC – Issued a letter with several technical comments (July 22, 2013)**
 - **Concurred with proposed sampling frequency modifications and suggested simultaneously sampling of specific wells.**
 - **Requested additional discussion of specific standby wells.**



Overview of Regulatory Comments (cont.)



DTSC Comment (paraphrased)

- Pumping rates have been reduced significantly for some OU-1A and OU-1B South extraction wells. Capture zones need to be verified with vector mapping.
- Capture vs. mass removal needs to be balanced.

Response (paraphrased):

- Capture zones are determined using two different methods, mathematical calculations based on extraction well efficiency, and vector mapping based on monitoring well water levels.
- Capture zone evaluation is used to recommend changes to recommended pumping rates to ensure continued plume capture. Balancing capture versus mass removal is a key goal of optimization.



Next Steps / Schedule



- **Continue biweekly, monthly, and quarterly Operation and Maintenance (O&M) Inspections**
- **Quarterly effluent sampling for OCSD discharge requirements**
- **Semiannual and annual groundwater monitoring and reporting**
- **Annual plume capture and optimization evaluations**

Schedule:

- **Final 2012 Annual Groundwater Monitoring Report—October 2013**



Acronyms



µg/L	micrograms per liter
COC	chemical of concern
EW	extraction well
GAC	granulated activated carbon
IC	institutional control
IRP	Installation Restoration Program
lbs	pounds
LTM	Long-Term Monitoring
MCAS	Marine Corps Air Station
OCSD	Orange County Sanitation District
O&M	Operation and Maintenance
OU	operable unit
RAB	Restoration Advisory Board
RAO	remedial action objective
RG	remedial goal
TCE	trichloroethene
TCP	trichloropropane
µg/L	micrograms per liter
VOC	volatile organic compound
WBZ	water bearing zone