FINAL
FORMER MARINE CORPS AIR STATION (MCAS) TUSTIN
90th Restoration Advisory Board (RAB) Meeting Minutes

Meeting Location: Tustin Senior Center, Tustin, California
Meeting Date/Time: 15 September 2010/7:00pm – 8:45pm
Minutes Prepared by: Carlos Melvin, CDM Federal Programs Corporation (CDM)

Attachment:

1. Presentation: Remedial Action Progress for Groundwater at Operable Unit (OU)-1A and -1B.
2. Presentation Figures: Figure 2: OU-1A/-1B North and PCAP Well Locations and Figure 3: OU-1B South Well Locations.

WELCOME/INTRODUCTIONS/AGENDA REVIEW:

Mr. Jim Callian (Base Realignment and Closure [BRAC] Environmental Coordinator [BEC] and Navy RAB Co-Chair) welcomed everyone and introduced the RAB community Co-Chairman, Mr. Don Zweifel. Self-introductions by all those in attendance followed. A total of 20 attendees signed the sign-in sheet.

GENERAL ANNOUNCEMENTS

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

- Mr. Callian reviewed the RAB meeting agenda for the evenings meeting; no changes to the agenda were suggested by the RAB. He also noted that Ms. Arnold, Navy Lead Remedial Project Manager (RPM), is not present for the meeting.
- Mr. Callian reminded everyone to sign-in for tonight's RAB meeting.
- Mr. Callian requested approval from the RAB members and Mr. Zweifel on the 19 May 2010 RAB Draft Meeting Minutes. Mr. Zweifel requested input/comments from RAB members. Several RAB members stated they had no comments and the minutes were approved without any changes. Mr. Callian stated the minutes will be finalized and uploaded to the BRAC website.
- Mr. Callian presented slides listing key Navy and Regulatory Agency contacts; RAB points of contact; Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Administrative Record (AR) File; Information Repository (IR) locations and hours; and environmental and reuse/redevelopment websites.
- Mr. Callian discussed how the next former MCAS Tustin RAB meeting is scheduled for 01 December 2010 and will run from 7pm to about 8:30pm. He also commented how the RAB mailer will be distributed a few weeks prior to the meeting, and if anyone has any trouble in receiving the mailer they should contact him.

ENVIRONMENTAL STATUS UPDATE

Mr. Callian provided an overview on the environmental status update.

- The environmental status update information is incorporated into the PowerPoint presentation and in the handouts.
- Mr. Callian indicated an update on OU-1A and -1B which have similar chemicals of concern (COCs). The summary focused on OU-1A and both sites/plumes were identified on the Carve-Out Area figure by Mr. Callian.
- Mr. Callian stated the COC for OU-1B North and South is trichloroethene (TCE), and TCE and 1,2,3-trichloropropane (TCP) for OU-1A.
- Mr. Zweifel inquired about Carve-Out Area 6 and how the plume is under a portion of the hanger. Mr. Callian concurred that Mr. Zweifel's comment is correct.
- Mr. Callian clarified that OU-1A and -1B and OU-3 have long term hydraulic containment remedies installed and monitoring of these sites will continued for probably the next 20 years. He noted the concentrations at these sites in the short term, should not fluctuate significantly but eventually will reduce to the remediation goals.
- Mr. Callian reiterated the RAB's focus is to promote or provide a forum for community input on environmental restoration activities and it is not to discuss re-development. The Navy has no input on re-development issues. Mr. Zweifel inquired who is the contact or proper channel to communicate redevelopment issues. Mr. Callian stated that the city of Tustin (Mr. West) is the appropriate contact. Mr. Callian also stated the goal of BRAC is to transfer property.
- Mr. Callian commented that activities associated with OU-3 (Site 1 – Moffett Trenches Landfill) are going great. He also mentioned that Site 1 will have long term groundwater monitoring activities.
- Mr. Callian expressed the primary focus of the RAB should be on the OU-4B sites (six total sites) and the remedies that are currently being designed.
- Ms. Kaleena Johnson (Environ) inquired about data updates on the monitoring activities for Miscellaneous Major Spill (MMS)-04. Mr. Callian stated the Navy has data from six sampling events over a one year time span that indicate the COC (TCE) is well below 5 micrograms per liter (µg/L), so the Navy will move forward with the closure of the site. Ms. Johnson inquired on the closure schedule. Mr. Callian responded that he was not certain, but that the Remedial Action Completion Report (RACR) must first be prepared.
- Ms. Susan Reynolds (RAB member) asked for clarification on the Mingled Plumes Area (MPA). Mr. Callian stated that the MPA consists of five Areas of Concern (AOCs) namely Disposal Sanitary Sewer (DSS)-01, DSS-02, Miscellaneous Disposal Area (MDA)-02, MMS-05, and Storage Temporary (ST)-67, which were investigated as a single site for the first time in 2003. The COC for the MPA is TCE. Mr. Callian indicated OU-4B has three low concentration sites (MMS-04, IRP-11, and IRP-13) and three moderate concentration sites (IRP-5S[a], IRP-6, and the MPA).

- Mr. Callian presented the upcoming deliverables for OU-4B and stated that the quarterly groundwater monitoring reports do not include recommendations. Mr. Callian also clarified the Navy does not expect concentrations to fluctuate significantly in the short term.
- Mr. Callian summarized the key activities for UST Site 222 and identified on-going operation and maintenance activities, which include inspections and sampling of the effluent discharges. Mr. Callian stated the 2nd Quarter 2010 Data Summary Report will be issued in October or November 2010. Mr. Callian stated the quarterly reports do not provide recommendations, but annual reports summarize an entire years worth of data and present recommendations. The Final 2009 Petroleum Corrective Action Plan (PCAP) Annual Report will be issued in November 2010.
- Mr. Matt Suarez (RAB member) inquired about an update on Finding of Suitability to Transfer (FOST) #9. Mr. Callian mentioned that he was not prepared to comment on FOST #9 for this RAB meeting. Mr. Peddada (Department of Toxic Substances Control [DTSC]) stated that DTSC will provide agency review comments on 01 October 2010. Mr. Callian stated the draft final version of the document will be accessible for public review.
- Mr. Suarez asked if institutional controls (ICs) have expiration dates. Mr. Callian stated that ICs are based on when the contaminants at the site reach their remediation goals. Mr. Suarez asked if the ICs will carry over with the transfer of the property. Mr. Callian stated the ICs will carry with the transfer and the Navy has the responsibility to monitor the contaminants at these sites. The Navy and the regulatory agencies will determine when the sampling/monitoring will be complete.
- Ms. Johnson inquired about a preview of the next quarter of groundwater monitoring sampling at UST Site 222. Mr. Louie Cardinale (Navy RPM) stated in August 2010 the maximum concentration in the Source Area was 26 µg/L, which is significantly below 300 µg/L (the cleanup goal). Mr. Cardinale stated that additional information will be forthcoming. Mr. Callian commented that the Navy will be trying to expedite the closure process; however, the schedule is not known at this time. Mr. Callian stated the Navy is completely funded for this and other former MCAS Tustin cleanup projects, but the specific allocation of funds to projects is being worked through administratively with the BRAC contracts personnel.

REGULATORY AGENCY UPDATE

Mr. Ram Peddada (DTSC)

Mr. Peddada provided an overview of the documents that the DTSC has recently reviewed. The Navy will review the comments that were provided by DTSC. Once the comments are finalized DTSC will submit a letter stating how DTSC concurs with the individual site recommendations. Mr. Peddada also stated DTSC reviewed FOST #9 in July 2010, and many comments were provided to the Navy. The Navy has since responded to DTSC's comments on FOST #9 and DTSC and the Navy will continue to coordinate on any unresolved issues. Mr. Peddada also stated the Navy has a land use covenant with FOST #9 which will be implemented through a document known as a CRUP (Covenant to Restrict Use of Property). Mr. Peddada acknowledged that DTSC is working with the Navy's attorney and the Draft FOST #9 was

submitted last week for review. Once both parties concur with the details of the CRUP, the Navy will then be able to transfer the property.

Mr. Zweifel asked Mr. Callian to define land use covenants verses activity restrictions. Mr. Callian will prepare a short description for the next RAB meeting.

PRESENTATION: REMEDIAL ACTION PROGRESS FOR GROUNDWATER AT OPERABLE UNIT (OU)–1A AND -1B

Mr. Cardinale initiated the presentation with an informal introduction of himself and Mr. Michael Wolff (Enviro Compliance Solutions [ECS]) as the key presenters.

A summary of the presentation included:

- Mr. Cardinale discussed the key overview items of the presentation, which consist of 10 items (Slide 2).
- The project "Milestone Documents" were identified and briefly explained in Slide 3. Mr. Cardinale stated that five of the six milestone documents for the project have been completed and the RACR is the last milestone report. The RACR will be completed once the remedial actions for the project are completed. Mr. Cardinale provided a brief description of each milestone report.
- Mr. Cardinale highlighted a few Milestone Documents and when they were submitted for the project (Slide 4). Mr. Zweifel inquired on the duration of remediation for the site. Mr. Callian responded that the remediation timeframe is somewhat uncertain, but most likely is on the order of a few decades.
- Slide 5 identified the selected remedy and main components for the project and Slide 6 identified the three primary components (Groundwater Extraction, Conveyance, and Treatment Systems).
- Mr. Cardinale stated how 21 extraction wells were utilized on the project and how the extraction well vaults were constructed below the ground surface (Slide 7). He also stated that the 21 extraction wells have been installed to cover three different plumes, identifying each plume.
- Slide 8 contained Figure 2 – OU-1A/-1B North and PCAP Well locations. Mr. Cardinale described the key features of the figure (i.e., well locations, piping, and the boundary). He stated that only three of the four extraction wells at OU-1B North System are in operation. The fourth well is on standby because contaminants were not detected in this well. Further details regarding the extraction well on standby are documented in the 2008 Final Annual Groundwater Monitoring Report. A general process flow of the treatment was also described. The same information was presented on Figure 3, Slide 9.
- Mr. Zweifel asked if the concrete pad for the Hangar (as reflected in Figure 2, Slide 8) is an obstruction. Mr. Cardinale stated that the concrete pad is not an obstruction.
- The conveyance and treatment systems implemented at each site were briefly described in Slide 10.

- The TCE plumes for OU-1A and OU-1B North, wells, piping, and treatment facility were depicted in Slide 11 and described by Mr. Cardinale. Mr. Peddada inquired about the location and relationship of the plume verses the Carve-Out boundary as depicted in Slide 11. Mr. Cardinale acknowledged and informed Mr. Peddada that the Navy will investigate the plume location.
- The TCE plume for OU-1B South, wells, piping, and treatment facility were depicted in Slide 12.
- Pictures of the treatment buildings for OU-1A, OU-1B North and OU-1B South were presented on Slide 13.
- Mr. Cardinale provided a description of the primary components at a typical project extraction well and those within the treatment facility (Slides 14 and 15).
- Mr. Cardinal summarized the remedial action objectives (Slide 16), and stated they are identical to those stated in the Record of Decision (ROD).
- Slide 17 outlines the primary COCs at OU-1A, OU-1B North and OU-1B South and the remediation goals for TCP and TCE. Mr. Cardinale stated that 130 wells have been installed to monitor the groundwater flow and to better understand the groundwater gradients and plumes. The data are used in the capture analysis, which Mr. Wolff will discuss in upcoming slides.
- Mr. Cardinale discussed when the remedial action commenced at each site, inspection reports, and operational data (Slide 18).
- Slide 19 and 20 outline the various inspections and maintenance activities that are implemented for the project.
- Mr. Cardinale presented the pumping rates and amounts of TCE removed at OU-1A/-1B North and OU-1B South systems. He clarified that higher concentrations of TCE exist at the OU-1B South site, so more TCE has been removed at this site (Slide 21).
- Mr. Cardinale transitioned the presentation over to Mr. Wolff to present the plume capture analysis and results (Slide 22).
- Mr. Wolff started with a definition of plume capture optimization. He stated that a system is optimized when plume capture is achieved without pumping excess groundwater. The removal of groundwater from the ecosystem needs to be optimized, so we do not extract more than we need to capture the plumes. In addition, the pumping and treatment process takes energy, so minimizing the total amount of energy required is another project goal. Conducting capture analysis assists in achieving the goals of the project.
- Mr. Wolff stated that there are two methods to analyze plume capture, and the first method is depicted in Slide 22. This method uses a computer program called Surfer. The program creates a three dimensional model of the groundwater flow using mathematical algorithms. The model shows the gradient vectors of the groundwater and tells us the direction of groundwater flow. These data help to define the capture zone for the system in relation to the plumes. Slide 22 illustrates how the flow arrows are all pointing toward the extraction wells. This level of data helps to ensure that the extraction wells are capturing the plume.

- Mr. Callian described that the three dimensional groundwater map prepared using Surfer is equivalent to a topographic map of the ground surface (Slide 22).
- Mr. Wolff clarified that circular areas on the figures (Slides 22 and 23) actually represent depressions in the groundwater table, which are produced by pumping, and water is flowing toward those depressions.
- Mr. Wolff summarized the key elements of the figure depicted in Slide 23 of OU-1B North and commented how the plume is being captured within the capture zone created by the pumping groundwater extraction wells.
- Mr. Wolff transitioned to Slide 24, which depicts a second method for evaluating plume capture. This second method utilizes a calculation that determines the capture zone dimensions by using parameters from the extraction and monitoring wells. The calculated values are plotted as parabolic shapes around the key extraction wells and represent theoretical representations of the capture zone for each well. The parabolas/data help to evaluate the physical size of the capture zones in relation to the plumes. Mr. Wolff stated that each parabolic curve on the figure relates to an extraction well. The overlapping capture zones presented on the figure show redundancy in the capture as you move south through the plume. These data provide an opportunity to optimize the pumping and treatment of the COC (i.e., increase the efficiency of the system).
- Mr. Wolff stated the methods of capture can be compared to support a strong correlation between the methods. Mr. Wolff stated the data sets for this project strongly correlate (Slide 24).
- Mr. Wolff stated the capture in OU-1B (Slide 25) is very good. The pumping has a strong impact on the groundwater gradient. Mr. Callian asked Mr. Wolff to state the depth to groundwater. Mr. Wolff indicated the depth to groundwater is very shallow (approximately 6 feet to the first water bearing zone) at OU-1B South and approximately 20 to 30 feet at OU-1B North (Slide 26).
- Mr. Suarez asked about the impact on the long term pumping and treatment with respect to extending the necessary treatment (i.e., will it take more time). Mr. Wolff responded that it will not take more time to reach the cleanup goals. Another reason is by pumping less water, we increase the treatment capacity over time. The pumped water is high in salts, which accumulate in the treatment filters and negatively impacts the efficiency of the treatment process. The goal is to only pump what is necessary to treat the impacted groundwater.
- Mr. Cardinale resumed the presentation on Slide 28 and explained the next steps of the project, scheduled deliverables for 2010, and noted the acronyms on Slide 29.
- Mr. West (city of Tustin) asked what time of year was the data obtained that was used in the plume capture analysis. Mr. Wolff stated the data were from the October/November timeframe and represents an average condition.
- Ms. Reynolds asked Mr. Cardinale if this evaluation will be conducted annually. Mr. Cardinale responded that the evaluation will be conducted annually.
- Ms. Johnson (Environ) asked why the size of the capture zone curve for Well 07D is so large. Mr. Wolff stated the pumping rate for the well is significantly higher and therefore has a

greater drawdown. Mr. Cardinale highlighted that Well 07D is pumping at 14 gallons per minute, while the others are pumping at a maximum rate of approximately 2 gallons per minute.

MEETING SUMMARY AND CLOSING COMMENTS

In closing, Mr. Callian stated the next meeting is scheduled for 01 December 2010. Mr. Callian presented a summary of the remaining Tustin 2011 RAB meetings and compared the meetings with the remaining reports and presentations. He indicated that there are not enough reports for presentations in 2011 for the number of RAB meetings. Mr. Callian suggested the Navy host RAB meetings on 18 May and 21 September 2011, and to provide project updates for the original proposed RAB meetings on 16 February 2011 and 7 December 2011 via e-mail. Mr. Zweifel noted that he communicated with Mr. Peddada (DTSC) who suggested fewer meetings than being proposed by the Navy, so Mr. Zweifel concurs with the proposed plan by the Navy. Mr. Robert Kopecky (RAB member) also concurred with the Navy's proposed RAB meeting plan for 2011.

- Mr. Suarez asked if e-mail updates would be allowed for feedback and sharing. Mr. Callian confirmed that sharing and feedback would be great and permissible.
- Ms. Reynolds requested that the Navy have an updated e-mail list to utilize. Mr. Callian confirmed and suggested that Ms. Reynolds coordinate with him and anyone else that is interested after the meeting.
- Mr. Zweifel suggested that if individuals have any comments or questions to distribute an e-mail to Mr. Callian. Mr. Callian confirmed that e-mails are welcomed.
- Ms. Reynolds inquired if the Navy could present an update on the new remedy being considered for the second water bearing zone at UST Site 222 at the next meeting. Mr. Callian may provide an update, but mentioned that the funding and/or the technology for the project have not been solidified. Ms. Reynolds also requested if an e-mail spot could be added to the sign-in sheet.
- Mr. Zweifel requested the Navy provide cost information on the restoration program. Mr. Callian indicated he would consider the request.

Mr. Zweifel adjourned the 90th Tustin RAB Meeting at 8:45.

LIST OF HANDOUTS PROVIDED AT THE MEETING

- 15 September 2010 Former MCAS Tustin RAB Meeting Agenda
- RAB Meeting Schedule
- Former MCAS Tustin - Where to Get More Information
- Environmental Websites
- MCAS Tustin Environmental Program Status
- Presentation Slides and Figures: Remedial Action Progress for Groundwater at Operable Unit (OU) 1A and 1B.
- Former MCAS Tustin RAB Mission Statement

- Former MCAS Tustin RAB Fact Sheet/Membership Application
- Former MCAS Tustin Mailing List Coupon

Copies of the meeting minutes and handouts provided at the 19 May 2010 RAB meeting are available at the CERCLA IR for former MCAS Tustin located at the University of California, Irvine, Main Library, Government Publications Section. Library hours are 8am to 7pm Monday through Thursday; 8am to 5pm Friday and Saturday; and 1pm to 5pm on Sunday. It is recommended 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. In addition, copies of the meeting minutes and handouts are also available at the CERCLA AR File maintained at Building 307 at former MCAS El Toro by Ms. Rawal. Documents can be viewed by appointment (call Ms. Rawal at [949] 859-6014) between 9am and 1pm Monday through Thursday.

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

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INTERNET SITES

Navy and Marine Corps Internet Access

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

Department of Defense – Environmental Cleanup Home Page Web Site:

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

Cal/EPA:

Homepage: www.calepa.ca.gov

Department of Toxic Substances Control: www.dtsc.ca.gov

Department of Health Services, reorganized into the Department of Health Care Services and the Department of Public Health: www.dhs.ca.gov

Santa Ana Regional Water Quality Control Board: www.waterboards.ca.gov/santaana

Additional Websites: Reuse and Redevelopment

Orange County Great Park: www.ocgp.org

Great Park Conservancy: www.orangecountygreatpark.org

September 2010

FORMER MARINE CORPS AIR STATION TUSTIN
ENVIRONMENTAL PROGRAM STATUS

Operable Unit 1A (Installation Restoration Program [IRP] Site 13 South – 1,2,3- Trichloropropane [TCP] plume)

Carve-Out: **CO-5**

Brief Project History:

- 2002: Time Critical Removal Action (hydraulic containment)
- 2004: Final Record of Decision (ROD): Selected remedy includes:
  - → Hydraulic containment of contaminated groundwater;
  - → Construction, operation, and maintenance of hydraulic containment system;
  - → Hot-spot soil removal to enhance groundwater remedy and;
  - → Implementation of institutional controls.
- 2007: Final Remedial Design and Remedial Action Implementation
- December 2007: Treatment system operational
- July 2008: Issued 1st Quarter Groundwater 2008 Groundwater Progress Monitoring Report
- October 2008: Issued 2nd Quarter 2008 Groundwater Progress Monitoring Report
- December 2008: Issued Final Interim-Remedial Action Completion Report (I-RACR); the main purpose of the I-RACR is to document that the remedy has been constructed per the Final Remedial Design
- December 2008: Issued 3rd Quarter 2008 Groundwater Progress Monitoring Report
- July 2009: Issued 1st Quarter 2009 Groundwater Monitoring Data Summary
- September 2009: Issued Final Long-Term Operation and Maintenance Plan (OMP)
- October 2009: Issued 2nd Quarter 2009 Groundwater Monitoring Data Summary
- December 2009: Issued 3rd Quarter 2009 Groundwater Monitoring Data Summary
- February 2010: Issued Final 2008 Annual OU-1A and -1B Performance Evaluation Report
- February 2010: Issued Final OPS Report
- June 2010: Issued Draft 2009 Annual OU-1A and -1B Performance Evaluation Report
- July 2010: Issued 1st Quarter Groundwater 2010 Groundwater Progress Monitoring Report
- September 2010: Issued 2nd Quarter Groundwater 2010 Groundwater Progress Monitoring Report

Next steps:

- On-going operation and maintenance activities.
- → Biweekly, monthly and quarterly inspections;
- → Quarterly effluent sampling for compliance with Orange County Sanitation District discharge requirements;
- → Quarterly groundwater monitoring and reporting
  - Data used to track system performance,
  - Annual evaluation for system optimization implementation
- → Annual optimization evaluation included in the 2009 Annual Report

- **November 2010: Issue Final 2009 Annual OU-1A and -1B Performance Evaluation Report**
- **December 2010: Issue 3rd Quarter 2010 Groundwater Monitoring Data Summary**

Septmber 2010

FORMER MARINE CORPS AIR STATION TUSTIN
ENVIRONMENTAL PROGRAM STATUS

Operable Unit 1B (IRP Sites 3 and 12 – Trichloroethene [TCE] plumes)

Carve-Outs: CO-5 and CO-6

Brief Project History:

- 2004: Final ROD: Selected remedy includes:
  - → Hydraulic containment of VOC-impacted groundwater;
  - → Construction, operation, and maintenance of a hydraulic containment system;
  - → Hot-spot soil removal to enhance groundwater remedy and;
  - → Implementation of institutional controls.
- 2007: Final Remedial Design and Remedial Action Implementation
- January 2008: Treatment system operational
- July 2008: Issued 1st Quarter 2008 Groundwater Progress Monitoring Report
- October 2008: Issued 2nd Quarter 2008 Groundwater Progress Monitoring Report
- December 2008: Issued Final I-RACR. The main purpose of the I-RACR is to document that the remedy has been constructed per the Final Remedial Design
- December 2008: Issued 3rd Quarter 2008 Groundwater Progress Monitoring Report
- July 2009: Issued 1st Quarter 2009 Groundwater Progress Monitoring Report
- September 2009: Issued Final Long Term OMP
- October 2009: Issued 2nd Quarter 2009 Groundwater Progress Monitoring Report
- December 2009: Issued 3rd Quarter 2009 Groundwater Progress Monitoring Report
- February 2010: Issued Final 2008 Annual OU-1A and -1B Performance Evaluation Report
- February 2010: Issued Final OPS Report
- June 2010: Issued Draft 2009 Annual OU-1A and -1B Performance Evaluation Report
- July 2010: Issued 1st Quarter Groundwater 2010 Groundwater Progress Monitoring Report
- September 2010: Issued 2nd Quarter Groundwater 2010 Groundwater Progress Monitoring Report

Next steps:

- On-going operation and maintenance activities.

→ Biweekly, monthly, and quarterly inspections;

→ Quarterly effluent sampling for compliance with Orange County Sanitation District discharge requirements; and

→ Quarterly groundwater monitoring and reporting

- Data used to track system performance and optimize system
- Annual evaluation for system optimization implementation

→ Annual optimization evaluation to be included in the 2009 Annual Report

- **November 2010: Issue Final 2009 Annual OU-1A and -1B Performance Evaluation Report**
- **December 2010: Issue 3rd Quarter Groundwater Monitoring Data Summary**

Septmber 2010

FORMER MARINE CORPS AIR STATION TUSTIN
ENVIRONMENTAL PROGRAM STATUS

Operable Unit 3 (Site 1– Moffett Trenches landfill)

Carve-Out: **CO-10 – PARCEL TRANSFERRED IN 2006**

Brief Project History:

- December 2001: Final ROD
- May 2003: Final OMP
- November 2003: Final OPS Report
    - U.S. EPA approval obtained in March 2004
- October 2006: Final First Five-Year Review
- On-going operation and maintenance activities
- January 2010: Issued Final 2008 Annual Groundwater Monitoring Report
- June 2010: Issued Draft 2009 Annual Groundwater Monitoring Report

Next steps:

- **Continue operation and maintenance activities**
- **November 2010: Issue Draft Final 2009 Annual Long-Term Monitoring Report (Replacement Pages)**

Operable Unit 4B (IRP-5S[a], IRP-6, IRP-11, IRP-13W, MMS-04, and Mingled Plumes Area [MPA])

Carve-Outs: **CO-2, CO-5, and CO-9**

Brief Project History:

- 2000: Draft OU-4 Focused Feasibility Study (FS) Report
- 2003: OU-4 Shallow Groundwater Investigation
- 2004: OU-4 Technical Memorandum presents results of shallow groundwater investigation
- 2005-2006: Groundwater Monitoring
- 2007: IRP-6 and MPA Supplemental Investigation
- September 2008: Final Technical Memorandum Supplemental Investigation at IRP-6 and MPA
- October 2008: Final FS Report
- February 2009: Proposed Plan. Public comment period: February 04-March 06, 2009
- May 2009: Issued Final Work Plan for Groundwater Monitoring at OU-4B Sites (IRP-5S[a], IRP-6, IRP-11, IRP-13W, MMS-04, and MPA)
- June 2009: Issued Final Work Plan for Installation of Groundwater Monitoring Wells at MPA, MMS-04, IRP-11, and IRP-13W
- January 2010: Issued 3rd Quarter Groundwater Progress Monitoring Data Summary Report
- January 2010: Issued Final ROD
- April 2010: Issued Replacement Pages for the Final ROD, including completed signature sheet
- April 2010: Issued Draft 2009 Annual Groundwater Monitoring Report
- July 2010: Issued Final Pre-Design Work Plan
- July-August 2010: Field work for OU-4B Pilot Study

September 2010

FORMER MARINE CORPS AIR STATION TUSTIN
ENVIRONMENTAL PROGRAM STATUS

Next steps:

- **Continue monthly groundwater monitoring for OU-4B Pilot Study (two more events)**
- **September: Issue Final 2009 Annual Groundwater Monitoring Report**
- **September 2010: Issue Final First Quarter 2010 Data Summary Report**
- **October 2010: Issue Final Second Quarter 2010 Data Summary Report**
- **December 2010: Issue Final Third Quarter 2010 Data Summary Report**

MTBE Plume (UST Site 222)

Carve-Outs: CO-5

Brief Project History:

- 2001: Interim-Petroleum Corrective Action Program (PCAP) plan implemented
- 2006: Final Soil Closure Report
- 2006: Interim PCAP Addendum No. 2 – Revised Cleanup Goals: 1st WBZ: 300 micrograms per liter (ug/L), 2nd WBZ: 44 ug/L, and 3rd WBZ: 13 ug/L.
- 2007: Final PCAP
- 2007/2008: Implement Final PCAP; Additional monitoring and extraction wells installed. Air Sparging/Soil Vapor Extraction (AS/SVE) initiated in March 2008.
- September 2008: AS/SVE system shut down for rebound monitoring per the Final PCAP requirements
- December 2008: Issued 1st and 2nd Quarter 2008 Groundwater Progress Monitoring Report
- April 2009: Issued 3rd Quarter 2008 Groundwater Progress Monitoring Report
- May 2009: Issued Draft Final Annual 2007 PCAP Progress Report
- July 2009: Issued Draft Annual 2008 PCAP Annual Report
- August 2009: Issued 1st Quarter 2009 Groundwater Monitoring Data Summary
- September 2009: Issued 2nd Quarter 2009 Groundwater Monitoring Data Summary
- September 2009: Issued Final Annual 2007 PCAP Annual Report
- October 2009: Issued Final/Replacement Pages for the Annual 2008 PCAP Annual Report
- January 2010: Issued 3rd Quarter 2009 Groundwater Monitoring Data Summary
- June 2010: Issued Draft 2009 PCAP Annual Report
- August 2010: Issued 1st Quarter 2010 Groundwater Monitoring Data Summary

Next steps:

- On-going operation and maintenance activities:
  - Quarterly Groundwater Monitoring and Reporting
  - Data used to track system performance, optimize system, and support Final PCAP Closure Report
- Quarterly effluent sampling for compliance with Orange County Sanitation District discharge permit requirements

→ Annual optimization evaluation to be included in the 2009 Annual Report

- **October 2010: Issue 2nd Quarter 2010 Groundwater Monitoring Data Summary**
- **November 2010: Issue Final 2009 PCAP Annual Report**

September 2010

FORMER MARINE CORPS AIR STATION TUSTIN
ENVIRONMENTAL PROGRAM STATUS

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**

FOSL Summary

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

Acronyms

AST	Aboveground Storage Tank	MNA	Monitored Natural Attenuation	PS	Public Sale Parcel
AOC	Area of Concern	MPA	Mingled Plumes Area	RAP	Remedial Action Plan
BCT	BRAC Cleanup Team (Navy, EPA, Cal EPA)	MMS	Miscellaneous Major Spill	RCRA	Resource Conservation and Recovery Act
CO	Carve-Out area	NFA	No Further Action	ROD	Record of Decision
EE/CA	Engineering Evaluation/ Cost Analysis	OMP	Operations and Maintenance Plan	TCE	Tricholoroethene
FOSL	Finding of Suitability to Lease	OPS	Operating Properly and Successfully	TCP	1,2,3-Trichloropropane
FOST	Finding of Suitability to Transfer	OU	Operable Unit	ug/L	Micrograms per liter
FS	Feasibility Study	PCAP	Petroleum Corrective Action Program	UST	Underground Storage Tank
I-RACR	Interim-Remedial Action Completion Report	MTBE	Methyl tert butyl ether	WBZ	Water-Bearing Zone

Remedial Action Progress for Groundwater at Operable Unit (OU) -1A and -1B

Former Marine Corps Air Station Tustin
Restoration Advisory Board Meeting
15 September 2010

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Navy BRAC Remedial Project Manager

Michael Wolff, P.G.,C.E.G
Enviro Compliance Solutions, Inc.

Presentation Overview

- Milestone Documents
- Remedy Components
- Remedial Action Objectives (RAOs)
- Remedial System Operation
- Operation and Maintenance (O & M) Activities
- Plume Capture Analyses
- 2009 Draft Annual Report Conclusions & Optimization Recommendations
- Next Steps / Schedule
- Acronyms
- Questions?

Milestone Documents

Record of Decision (ROD)
Document that describes the selected remedy at OU-1A and 1B and reasons for the selection based on the nine criteria in the NCP.

Remedial Design (RD) /Remedial Action Work Plan (RAWP)
Document that provides the actual design of the remedy (RD) at OU-1A and -1B and plans for how the remedy will be staged and implemented (RAWP).

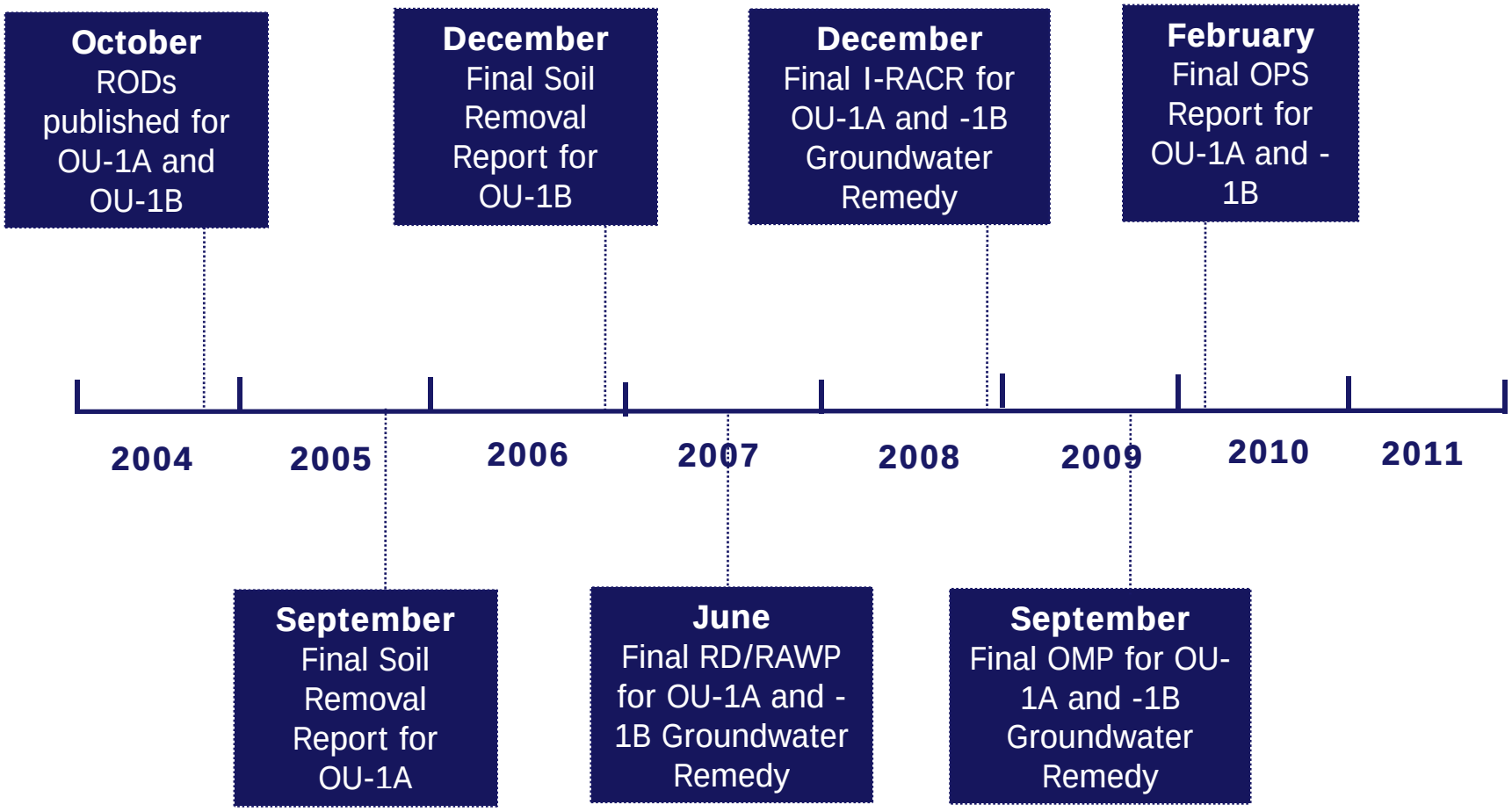
Interim Remedial Action Completion Report (I-RACR)
Document that demonstrates that the remedy for OU-1A and -1B has been constructed.

Operation and Maintenance Plan (OMP)
Document that specifies how the remedy will be operated, maintained, monitored and optimized over its lifetime.

Operating Properly and Successfully (OPS) Report
Document that demonstrates that the remedy for OU-1A and -1B is in place and operating properly and successfully.

Remedial Action Completion Report (RACR)
Document that demonstrates that the remedial action objectives have been met and remedies have been completed.

Milestone Documents for OU-1A and OU-1B



Remedy Components

Remedy:

- **Hydraulic Containment with Hot-Spot Removal**

Main Components:

- **Construction, operation, and maintenance of a groundwater extraction, treatment, and monitoring system**
- **Soil removal to optimize the groundwater remedy**
- **Institutional Controls to prevent extraction and use of shallow impacted groundwater**

Remedy Components (cont)

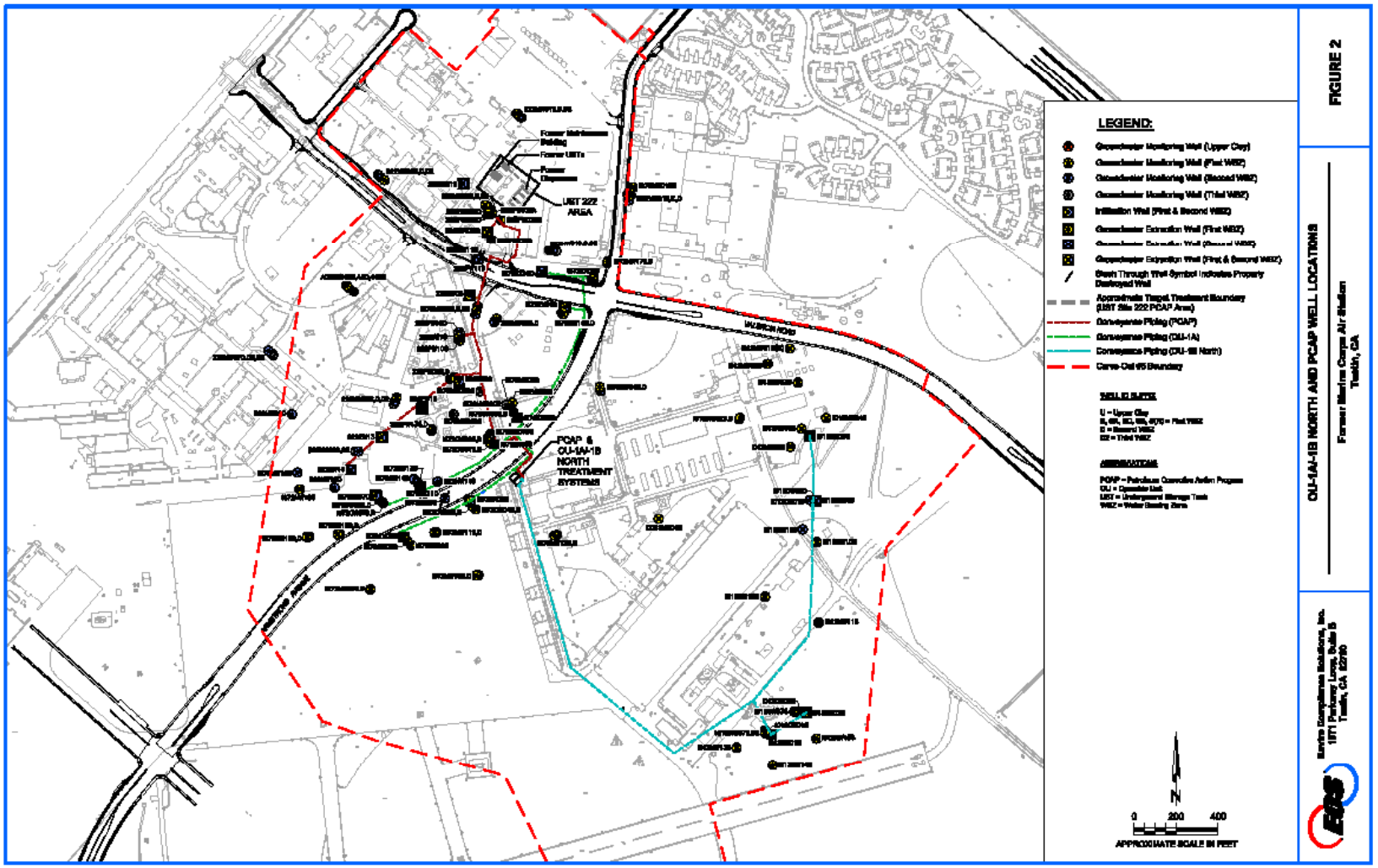
Three primary components:

- **Extraction System (wells, pumps, controls, and subsurface vaults)**
- **Conveyance System (subsurface piping)**
- **Treatment System (building and equipment)**

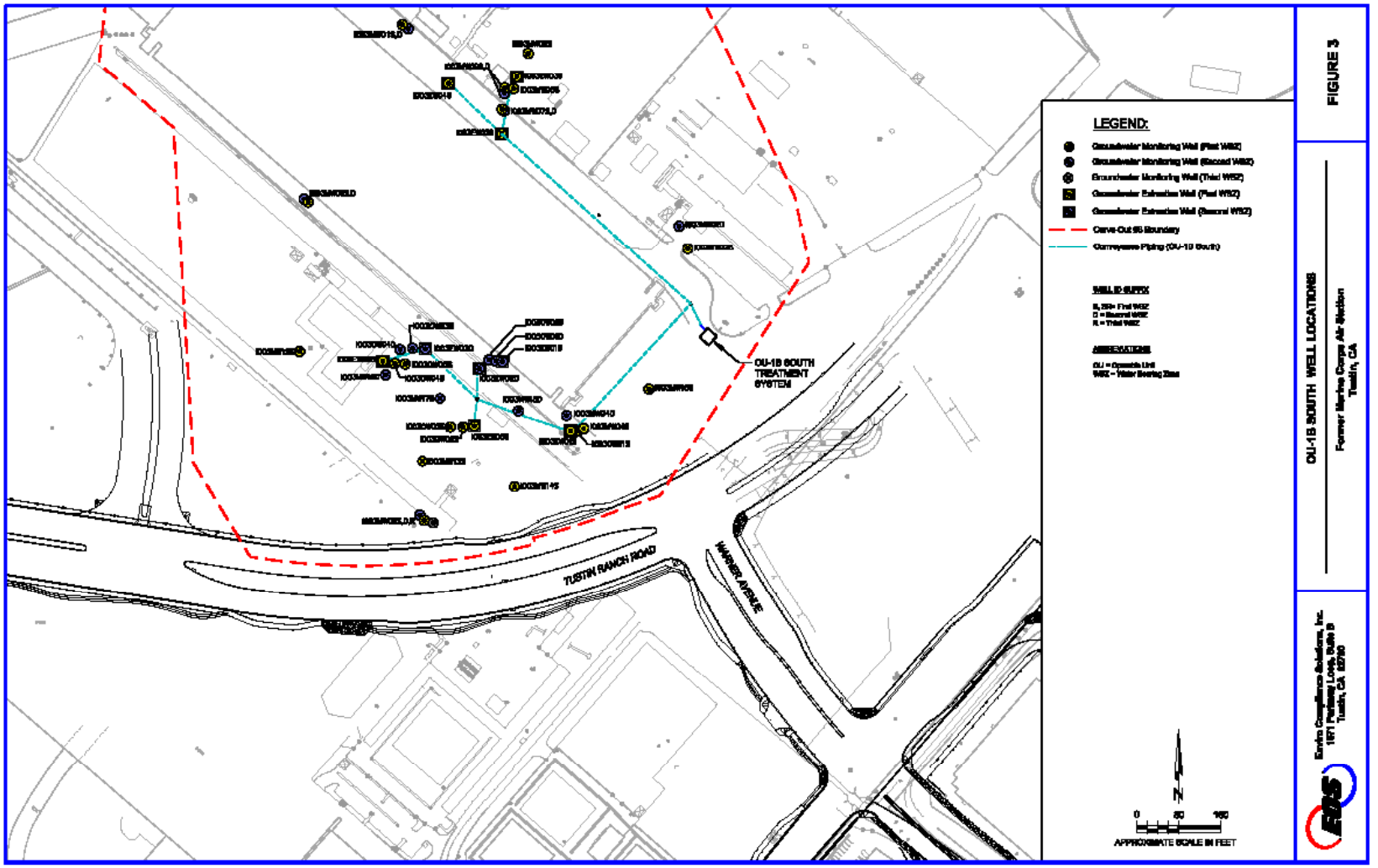
Remedy Components (cont)

- Total of 21 extraction wells (EWs) (20 operating)
  - 9 EWs at OU-1A System
  - 4 EWs at OU-1B North System (3 operating)
  - 8 EWs at OU-1B South System
- Extraction well vaults constructed below ground surface
  - Each vault contains mechanical and electrical components which control pump operation

Remedy Components (cont)



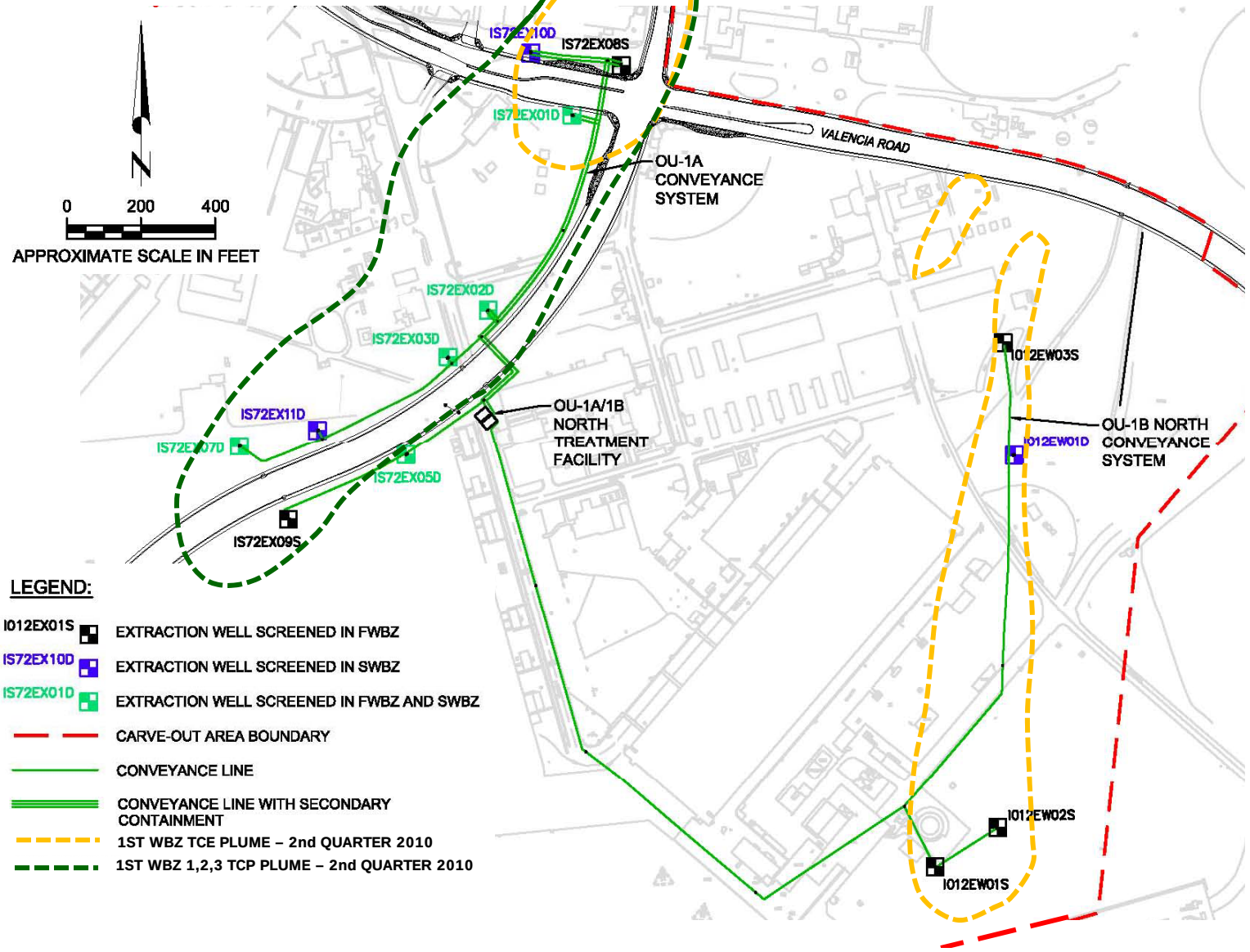
Remedy Components (cont)



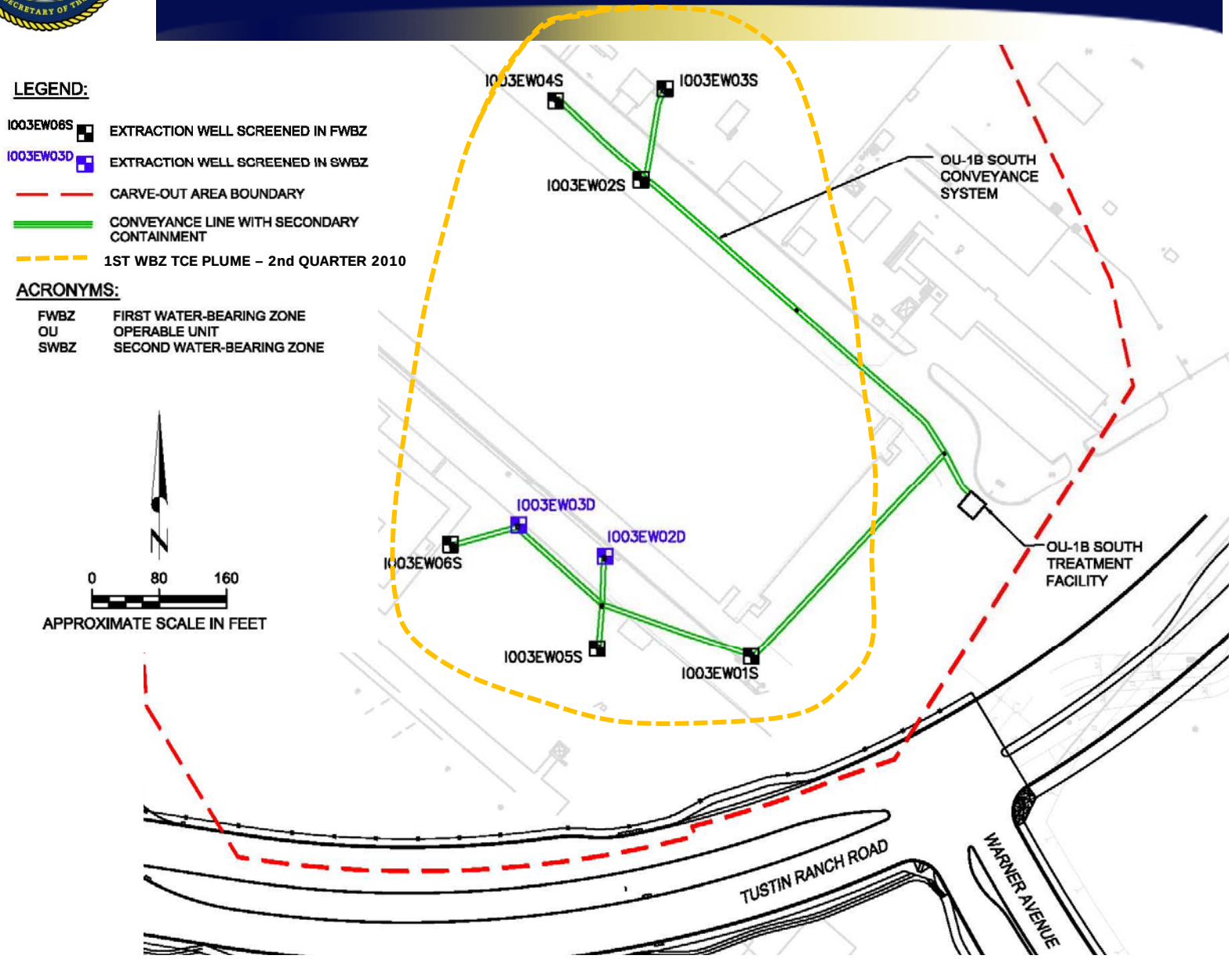
Remedy Components (cont)

- Conveyance System
  - Underground piping
- Treatment systems
  - Process equipment: holding tank, feed pump, 3 granulated activated carbon (GAC) vessels
  - Control equipment: level sensors, pressure gauges, master control panel, and communication system

Remedy Components (cont)



Remedy Components (cont)



Remedy Components (cont)

Treatment Building at OU-1A and OU-1B North

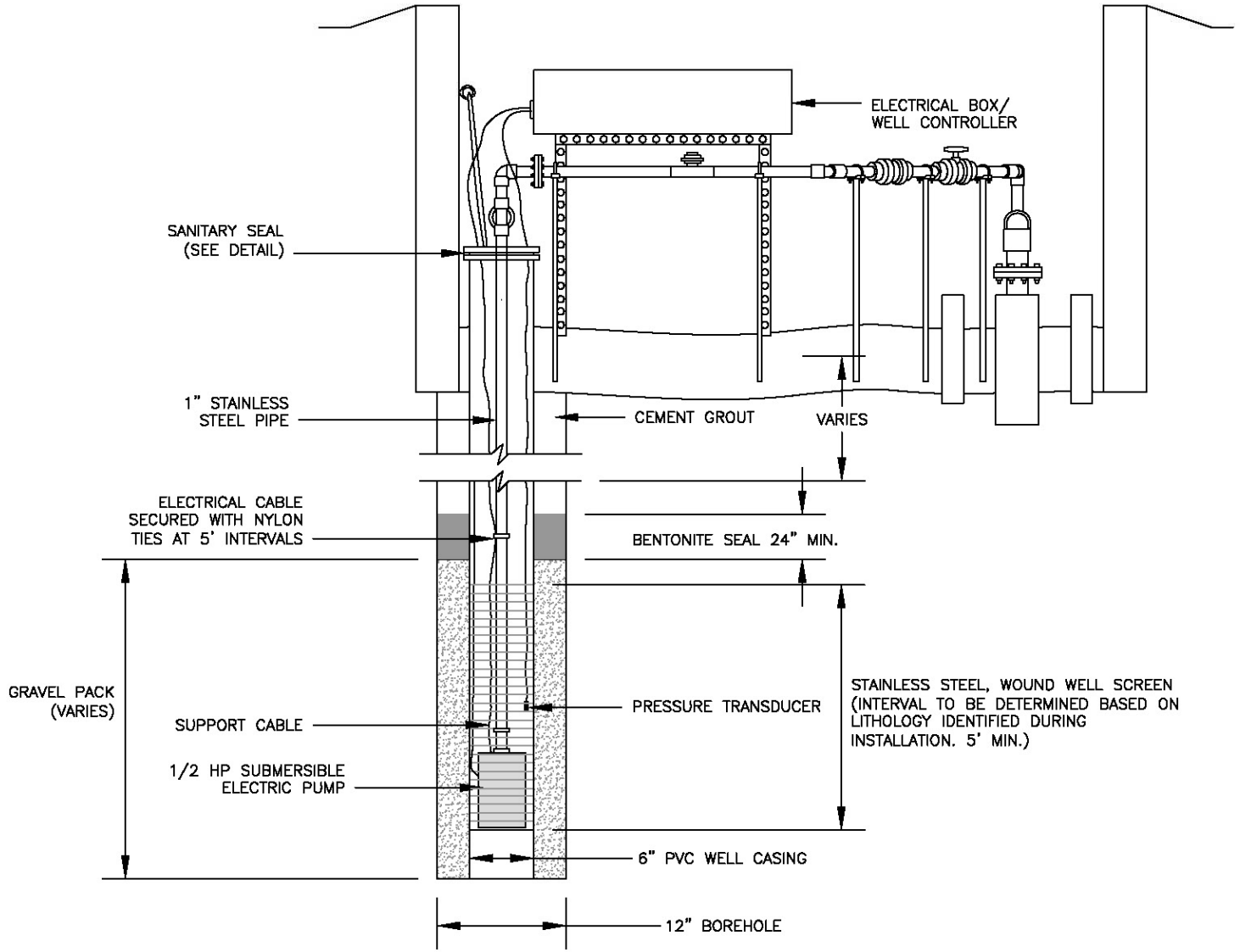
Treatment Building at OU-1B South

Remedy Components (cont)

Carbon Filter (Liquid Phase GAC) Units and Manifold

Electrical and Control System Panels

Remedy Components (cont)



Remedial Action Objectives (RAOs)

- Reduce concentrations of volatile organic compounds (VOCs) in groundwater to levels consistent with remediation goals, 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 remediation goals 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 remediation goals.
- Implement appropriate remedial actions as necessary to facilitate the transfer and reuse of the properties.

RAOs (cont)

Primary Chemicals of Concern (COC's)

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:

– 1,2,3-TCP remediation goal = 0.5 micrograms per liter (µg/L)

– TCE remediation goal = 5 µg/L

Remedial System Operation

Remedial action commenced:

- **OU-1A/-1B North treatment system was started on December 7, 2007.**
- **OU-1B South treatment system was started on January 2, 2008.**

Testing and inspections verified that remedial construction was completed in accordance with Remedial Design

- **Test results and inspection reports are provided in I-RACR report.**

Operational data confirmed that remedial systems are operating properly and successfully

- **BCT concurred with OPS demonstration**

Operation and Maintenance (O & M)

Regular Inspections and Maintenance:

- **Biweekly inspections (treatment plants)**
- **Monthly and quarterly inspections and maintenance of all remedial equipments.**
- **Quarterly sampling of effluent to comply with Orange County Sanitation District discharge requirements.**

O & M (cont)

Quarterly Groundwater Monitoring:

- **Water level measurements (130 wells) to evaluate groundwater flow directions.**
- **Groundwater sampling (50 wells) to track the plume.**
- **Sampling of discharge from 20 EWs to evaluate system performance.**

Data are also used to:

- **Evaluate plume capture**
- **Optimize the extraction systems.**

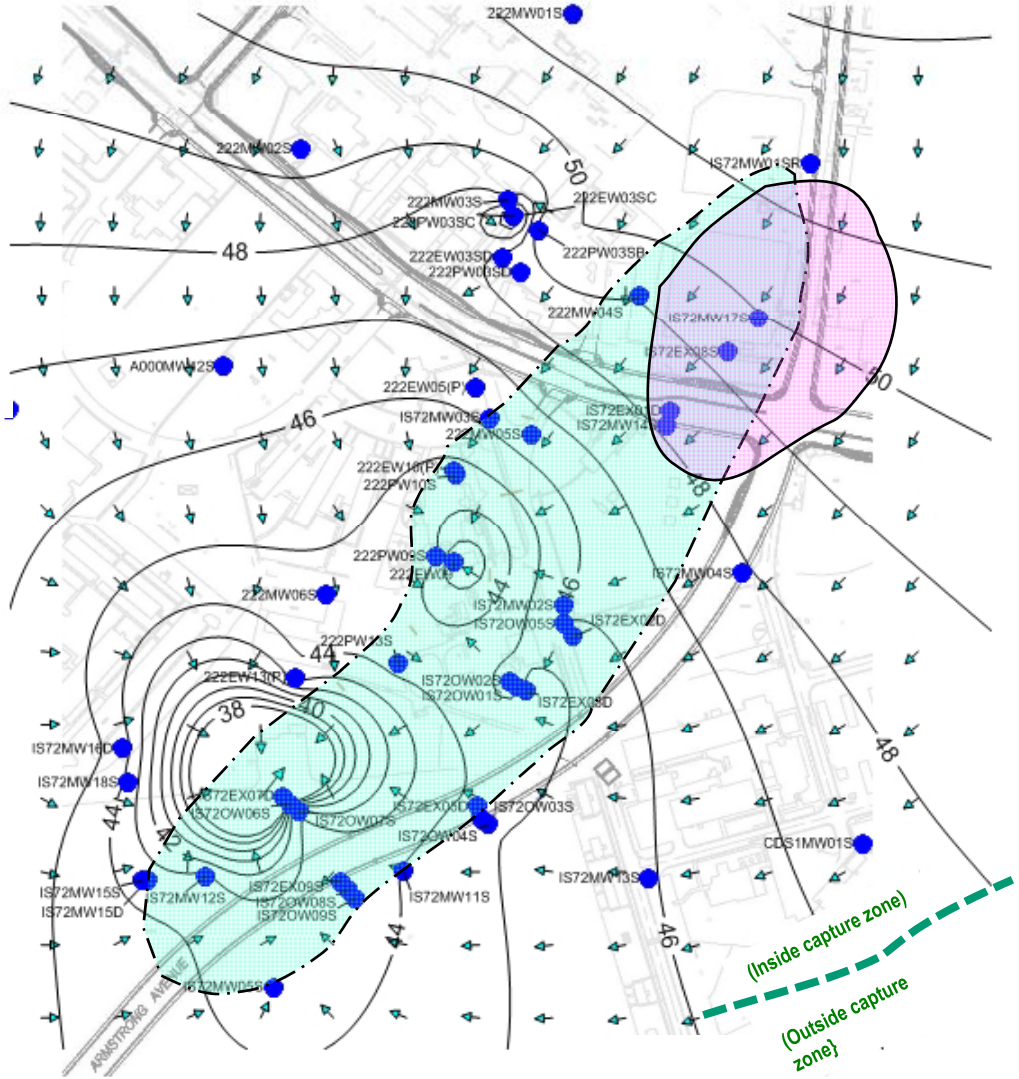
O & M (cont)

- ***OU-1A/-1B North System***
  - Current extraction/treatment rate: 20 gpm (3rd Quarter 2010)
  - Total volume groundwater treated (8/31/10): 40.4 million gallons
  - Total 1,2,3-TCP/TCE captured and removed (8/31/10): 2.3 lbs/5.3 lbs

- ***OU-1B South System***
  - Current extraction/treatment rate: 9 gpm (3rd Quarter 2010)
  - Total volume groundwater treated (8/31/10): 20.1 million gallons
  - Total TCE captured and removed (8/31/10): 75.2 lbs

Plume Capture Analysis

2009 Surfer® Results – OU-1A (First WBZ)



Capture zone boundary lies outside contoured area

LEGEND

- —46— Groundwater Contour with Elevation (ft)
- Groundwater Flow Direction
- Extent of 1,2,3, Trichloropropane in Groundwater at concentrations > 0.5 ug/L (cleanup goal)
- Extent of Trichloroethene in Groundwater at concentrations > 5 ug/L (cleanup goal)
- Boundary of Capture Zone
- Monitoring or Extraction Well

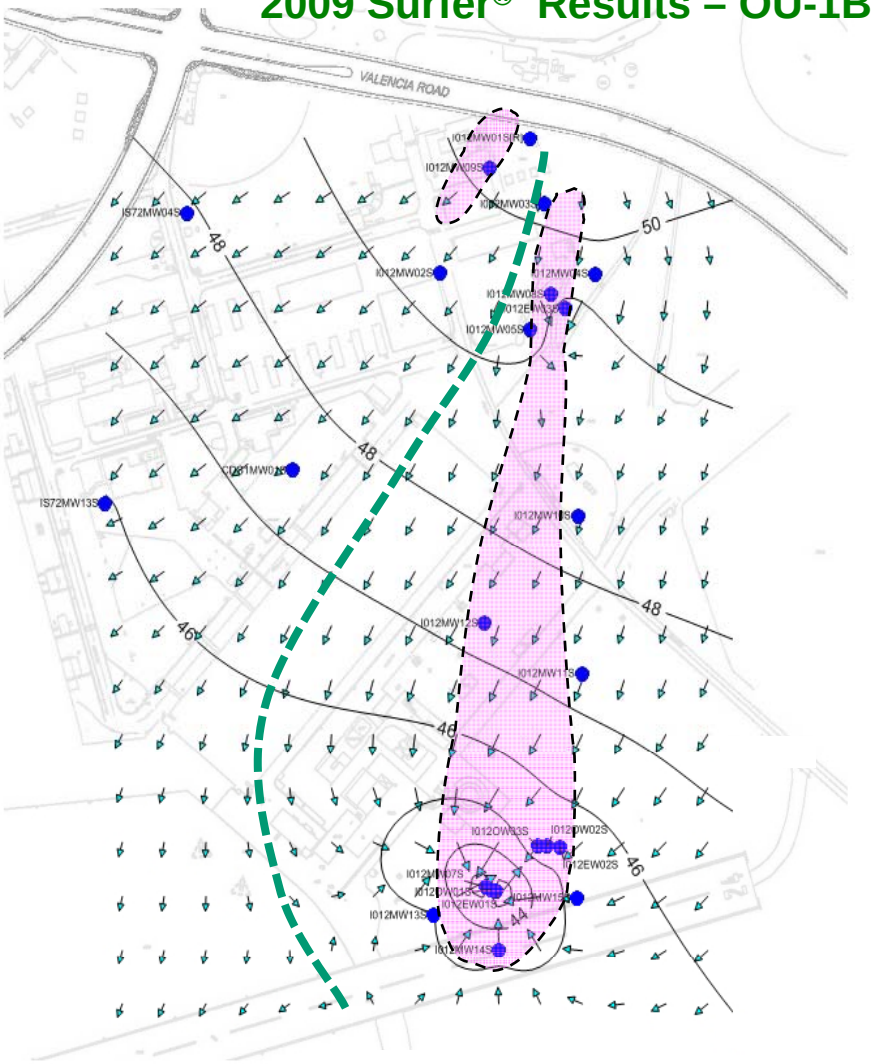
N

0 200 400

SCALE (ft)

Plume Capture Analysis (cont)

2009 Surfer® Results – OU-1B North (First WBZ)



LEGEND

- 46 — Groundwater Contour with Elevation (ft)
- Groundwater Flow Direction
- Extent of Trichloroethene in Groundwater at concentrations > 5 ug/L (cleanup goal)
- Boundary of Capture Zone
- Monitoring or Extraction Well

N

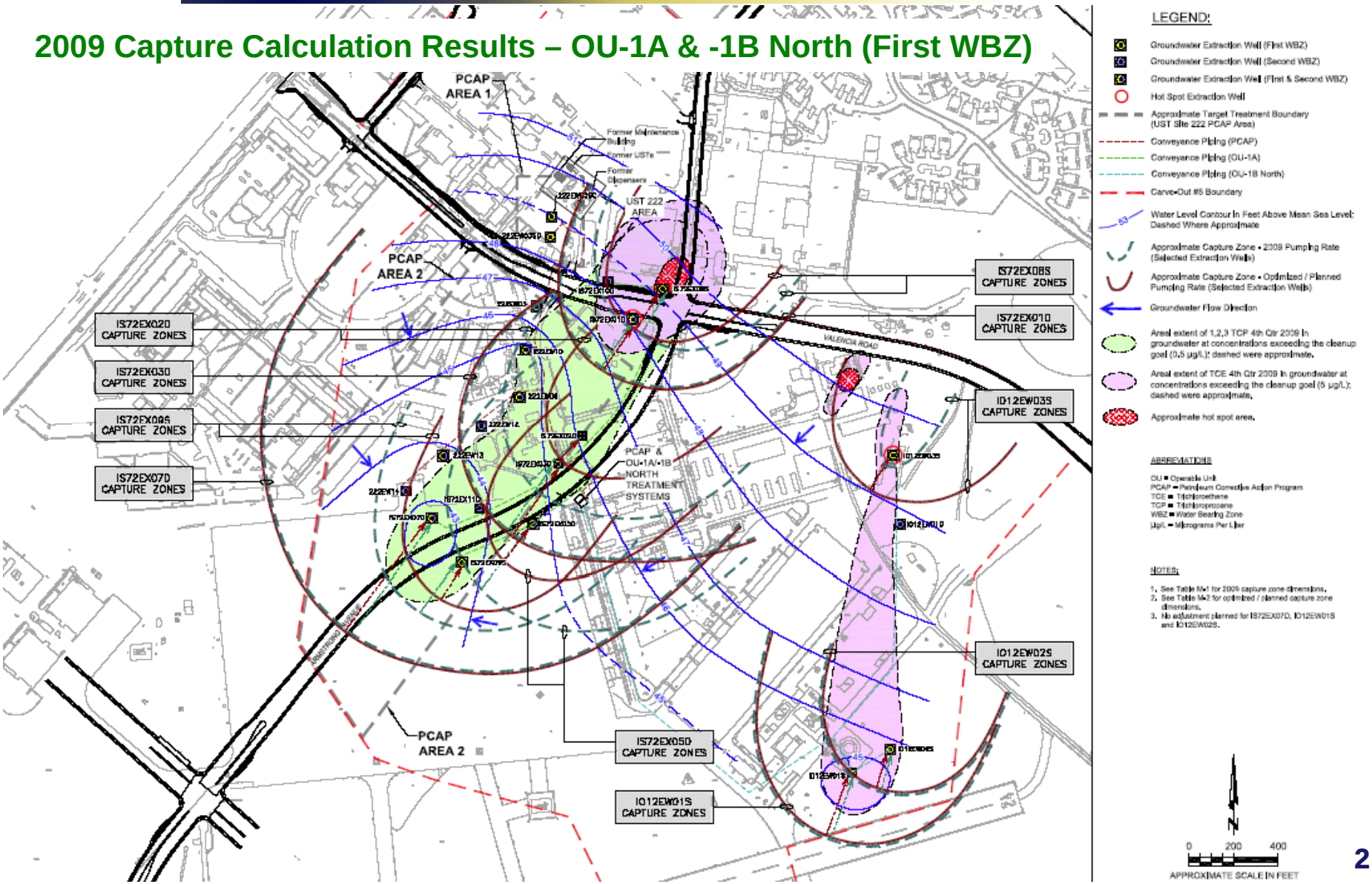
0 200 400

SCALE (ft)

Capture zone boundary lies outside contoured area

Plume Capture Analysis (cont)

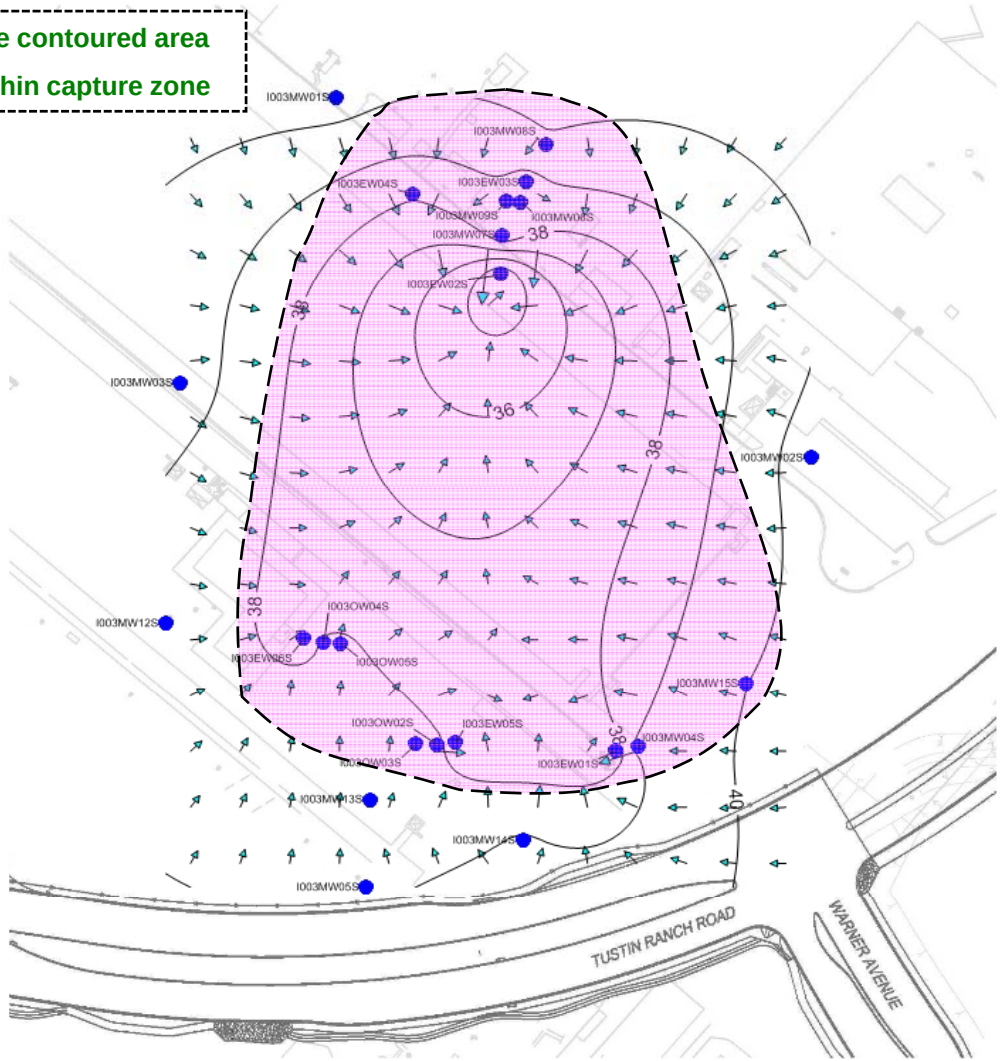
2009 Capture Calculation Results – OU-1A & -1B North (First WBZ)



Plume Capture Analysis (cont)

2009 Surfer® Results – OU-1B South (First WBZ)

Entire contoured area is within capture zone



LEGEND

- 46 — Groundwater Contour with Elevation (ft)
- Groundwater Flow Direction
- Extent of Trichloroethene in Groundwater at concentrations > 5 ug/L (cleanup goal)
- Boundary of Capture Zone
- Monitoring or Extraction Well

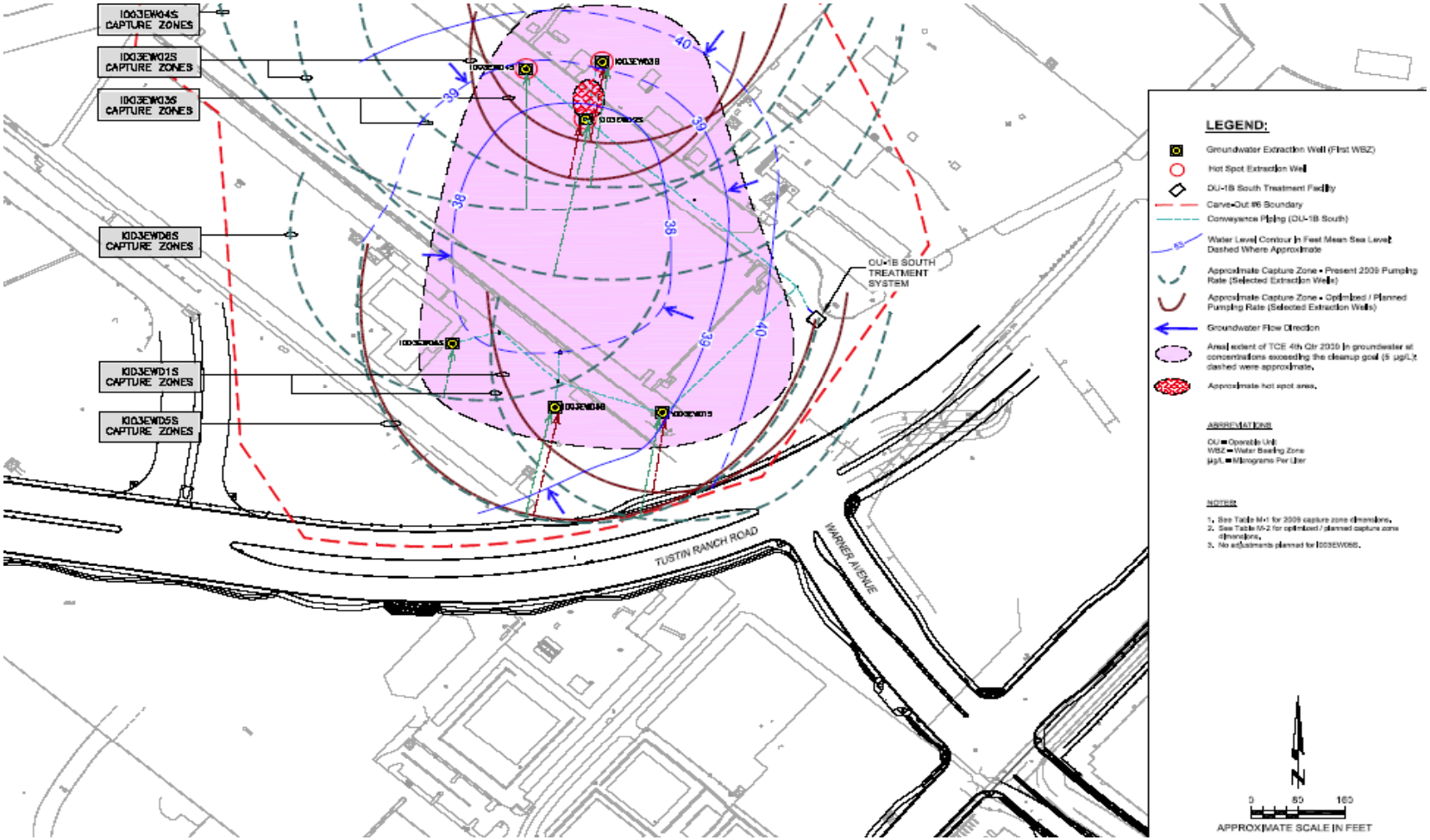
N

0 200 400

SCALE (ft)

Plume Capture Analysis (cont)

2009 Capture Calculation Results – OU-1B South (First WBZ)



2009 Draft Annual Optimization Conclusions & Recommendations

Conclusions:

- ICs were Successfully Implemented
- System Operated at Nearly 100 %
- All Plumes Continue to be Captured
- No Violations of OCSD Discharge Requirements

Recommendations:

- Groundwater Sampling Frequencies can be Reduced
- Redundant Extraction Pumps can be Placed on Standby
- Select Extraction Pumping Rates can be Reduced

Next Steps

Next Steps:

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

Schedule:

- **Final 2009 Annual – November 2010**
- **3rd Quarter Data Summary – December 2010**

Acronyms

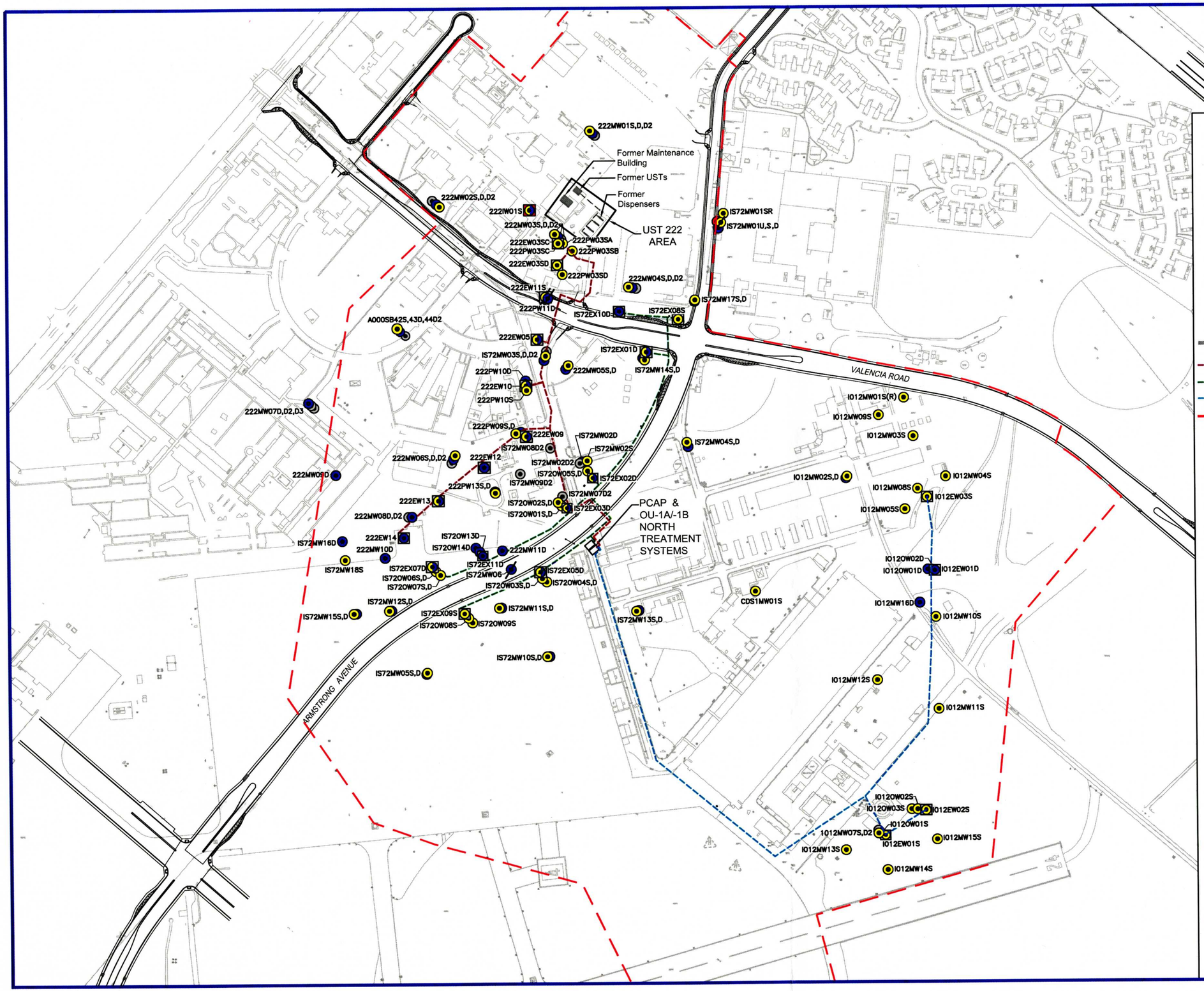
COC	chemical of concern
EW	extraction well
GAC	granulated activated carbon
I-RACR	interim remedial action completion report
IRP	Installation Restoration Program
O&M	operation and maintenance
OCSD	Orange County Sanitation District
OMP	Operation and Maintenance Plan
OPS	operating properly and successfully
OU	operable unit
RAWP	remedial action work plan
RD	remedial design
ROD	record of decision
TCE	trichloroethene
1,2,3 TCP	1,2,3 trichloropropane
µg/L	micrograms per liter
VOC	volatile organic compound
WBZ	water bearing zone

Questions?

FIGURE 2

OU-1A/-1B NORTH AND PCAP WELL LOCATIONS

Former Marine Corps Air Station
Tustin, CA



LEGEND:

- Groundwater Monitoring Well (Upper Clay)
- Groundwater Monitoring Well (First WBZ)
- Groundwater Monitoring Well (Second WBZ)
- Groundwater Monitoring Well (Third WBZ)
- Infiltration Well (First & Second WBZ)
- Groundwater Extraction Well (First WBZ)
- Groundwater Extraction Well (Second WBZ)
- Groundwater Extraction Well (First & Second WBZ)
- Slash Through Well Symbol Indicates Properly Destroyed Well
- Approximate Target Treatment Boundary (UST Site 222 PCAP Area)
- Conveyance Piping (PCAP)
- Conveyance Piping (OU-1A)
- Conveyance Piping (OU-1B North)
- Carve-Out #5 Boundary

WELL ID SUFFIX

U = Upper Clay
S, SA, SC, SB, S(R) = First WBZ
D = Second WBZ
D2 = Third WBZ

ABBREVIATIONS

PCAP = Petroleum Corrective Action Program
OU = Operable Unit
UST = Underground Storage Tank
WBZ = Water Bearing Zone

N

0 200 400

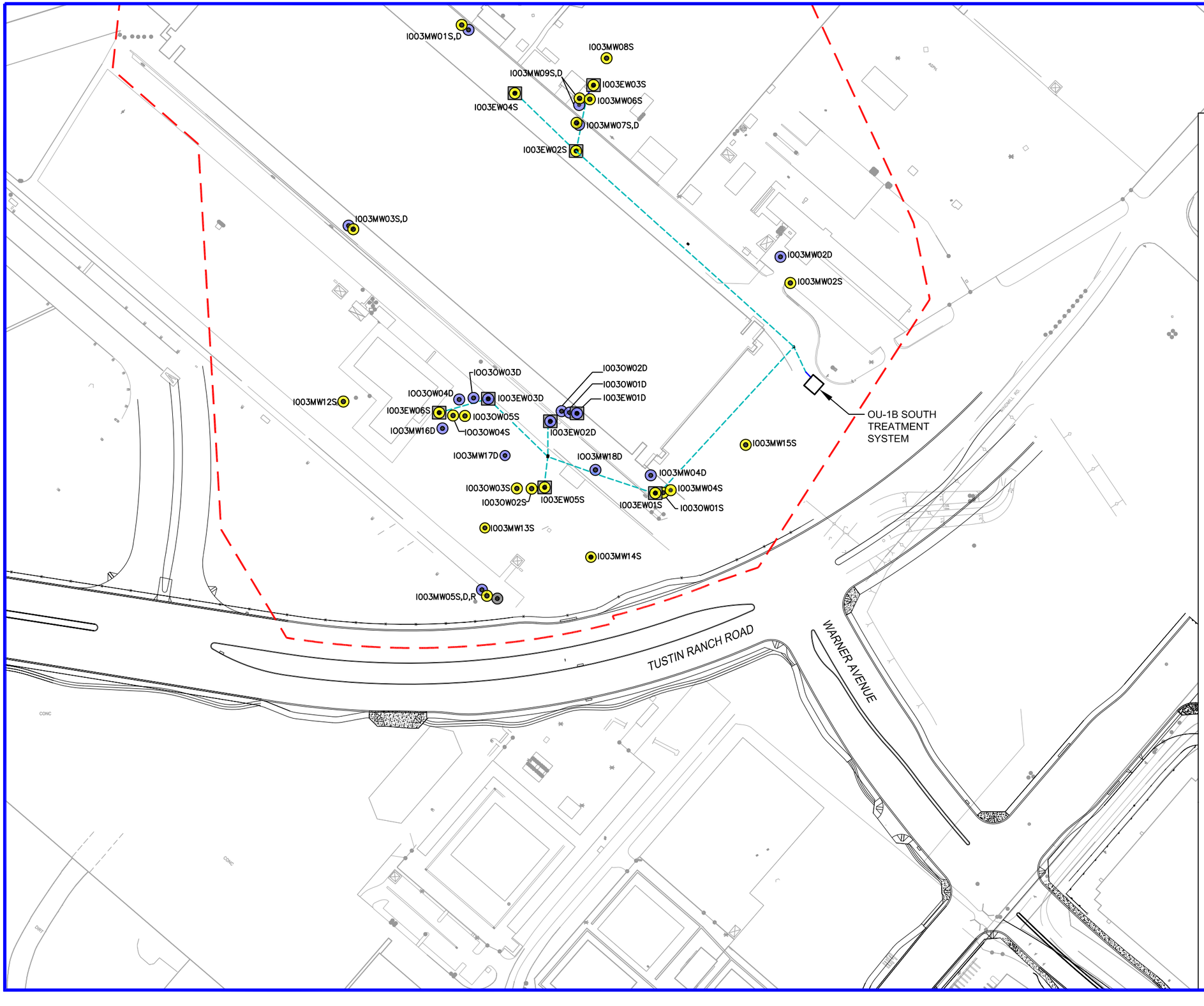
APPROXIMATE SCALE IN FEET

Enviro Compliance Solutions, Inc.
1571 Parkway Loop, Suite B
Tustin, CA 92780

FIGURE 3

OU-1B SOUTH WELL LOCATIONS

Former Marine Corps Air Station
Tustin, CA



LEGEND:

- Groundwater Monitoring Well (First WBZ)
- Groundwater Monitoring Well (Second WBZ)
- Groundwater Monitoring Well (Third WBZ)
- Groundwater Extraction Well (First WBZ)
- Groundwater Extraction Well (Second WBZ)
- Carve-Out #6 Boundary
- Conveyance Piping (OU-1B South)

WELL ID SUFFIX

S, SR= First WBZ
D = Second WBZ
R = Third WBZ

ABBREVIATIONS

OU = Operable Unit
WBZ = Water Bearing Zone

N

0 80 160

APPROXIMATE SCALE IN FEET

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