



FACT SHEET

Sites 18 and 24 Groundwater Cleanup Update Installation Restoration Program Former Marine Corps Air Station, El Toro



February 2006

Construction Moves Forward on Pipelines and Treatment Plants for Cleanup of Solvent Contaminated Groundwater

This fact sheet provides an update on remedial action activities for cleanup of groundwater contaminated with solvents containing volatile organic compounds (VOCs) at Installation Restoration Program (IRP) Site 18, Principal Aquifer Plume, and IRP Site 24, the VOC Source Area. (A plume is a zone within a groundwater aquifer that contains contaminants.) This fact sheet focuses on the additional activities that are now underway or are planned to start later this year. A previous fact sheet issued in June 2005 covered the initial remedial action activities underway at Site 24. These remedial action activities are part of the Irvine Desalter Project (see sidebar) and include well rehabilitation and construction of groundwater treatment plants and associated pipelines to treat VOC-contaminated groundwater from Sites 18 and 24.

IRVINE DESALTER PROJECT

The Irvine Desalter Project consists of two separate water systems. The non-potable system will extract and treat VOC-contaminated regional groundwater from areas within the principal aquifer (Site 18) that have VOC concentrations above drinking water standards. Additional wells at the leading edge of the plume will extract groundwater to prevent the plume from spreading into the main Orange County Groundwater Basin. Treated water will be used in the Irvine Ranch Water District non-potable system for reclamation purposes such as watering golf courses or green belts. The potable system will extract and treat groundwater from outside the VOC plume. This water will be treated to remove nitrates and total dissolved solids, which is typically done for water that is used for drinking water. The Irvine Desalter Project, the settlement agreement, and the Explanation of Significant Differences help ensure that the Navy's groundwater cleanup is safely and effectively coordinated with the water supply objectives of the water districts.

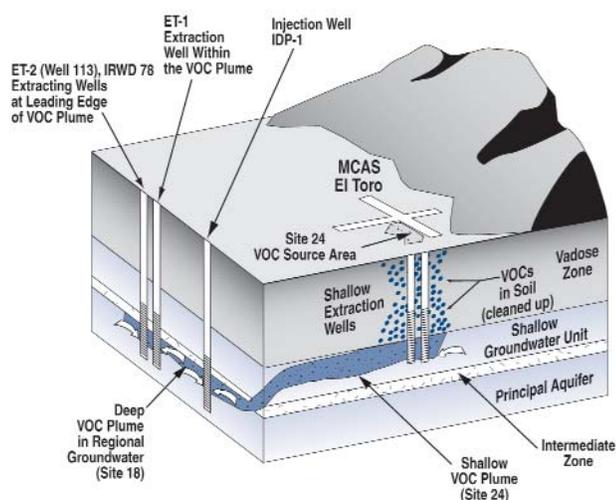
Separate treatment plants are being constructed to treat VOC-contaminated groundwater from the regional aquifer (Site 18) and the shallow aquifer (Site 24). Cleanup activities are being conducted in accordance with the 2001 settlement agreement between the U.S. Department of Justice, on behalf of the Marine Corps and the Navy, and the Orange County Water District and the Irvine Ranch Water District (IRWD), and the Record of Decision (ROD) that was finalized in 2002 which documents regulatory agency concurrence for groundwater cleanup. The U.S. Environmental Protection Agency and the California Environmental Protection Agency, including the Department of Toxic Substances Control and the Santa Ana Regional Water Quality Control Board, are the regulatory agencies that review and provide input on cleanup projects for the former station. The Navy is managing the cleanup project for the Marine Corps.

During the design phase of groundwater extraction and treatment systems for VOC-contaminated groundwater, the IRWD recommended new locations for some wells and treatment equipment and enhancements to the treatment systems. These design changes met with the approval of the Department of Justice and are included in the Explanation of Significant Differences (ESD) document that modified the ROD. The ESD was completed by the Navy in August 2005 and it documented regulatory agency concurrence with the design modifications. Project progress on the cleanup of groundwater has been shared regularly with community members at the bimonthly public meetings of the Restoration Advisory Board for the former MCAS El Toro.

Site Description

Past operations and practices at Former MCAS El Toro have contributed to soil and groundwater VOC contamination. Industrial activities at Site 24, VOC Source Area, such as dust suppression with waste liquids, paint stripping, degreasing, vehicle and aircraft washing, and waste disposal activities involved the use of solvents containing VOCs such as trichloroethene (TCE) and tetrachloroethene. Waste solvents may have reached the surface or subsurface through leakage, runoff, storm drains, or direct application to the soil and are believed to be the source of VOCs in the regional groundwater. The precise origin, nature, and use of TCE released at the site and the circumstances and quantities of individual releases are not documented. TCE usage at Former MCAS El Toro is believed to have been discontinued in the mid 1970s.

Past chemical releases contaminated soil and migrated downward into the groundwater which resulted in a plume of VOC-contaminated groundwater that extends approximately 3 miles to the west of the former station. The figure below shows an underground view of the sites, while the map on page 4 shows locations of both sites and the groundwater plume. Groundwater cleanup of the plume will address two distinct areas: 1) the shallow groundwater unit or SGU where the shallow VOC plume is located (Site 24); and 2) the deep VOC plume in the principal aquifer (Site 18). The VOC plume begins on-station in the shallow groundwater and extends into the deep groundwater towards Culver Drive in Irvine.



Underground view of the VOC plume.

Remedial Action Objectives for Groundwater

Remedial action objectives guided the development of cleanup actions being taken to address VOC-contaminated groundwater. This fact sheet focuses on additional remedial actions to be conducted to complete the construction of components necessary to conduct the cleanup at Sites 18 and 24. These additional remedial actions consist of refurbishment of extraction wells, installation of conveyance systems, and construction of groundwater treatment facilities. In order to best understand the overall objectives for groundwater, remedial action objectives for both Sites 18 and 24 are listed below:

- Reduce concentrations of VOCs to federal or state cleanup levels in the shallow groundwater unit and in the principal aquifer (regional groundwater).
- Prevent VOCs at concentrations above cleanup levels from migrating beyond the shallow groundwater unit into the principal aquifer.
- Contain the migration of VOCs above cleanup levels in the principal aquifer.
- Prevent use of groundwater containing VOCs at concentrations above cleanup levels for domestic use and other purposes.

Remedial Actions Conducted at Site 24

Construction activities began in March 2005 with the installation of extraction wells and associated conveyance piping in the VOC source area. The conveyance piping extends to the former property boundary of MCAS El Toro and will connect up to the treatment system that is now under construction. Installation of the extraction wells is complete. Conveyance piping and other associated connections are scheduled for completion by December 2005. Testing of the extraction and conveyance system for VOC-contaminated groundwater will be conducted in January 2006. The conveyance system is scheduled to be connected to the treatment system in May 2006.

Pre-Design Investigations

Pre-design investigations were performed to better determine characteristics of the principal aquifer, groundwater extraction well production pumping rates, and test technologies for treating solvent-contaminated groundwater. Obtaining this information was necessary for completing the design of the principal aquifer extraction, conveyance, and treatment systems. The pre-design investigations included conducting pilot tests to determine the effectiveness of groundwater treatment systems. An injection well test was performed to determine parameters for pumping treated clean water back into the aquifer. Information obtained helped to refine computerized groundwater modeling and determine the required number of extraction wells and pumping rates. Computer modeling is a key tool used by engineers in designing groundwater extraction systems.

Pilot tests were used to determine the treatability of the principal aquifer groundwater. Test results helped determine that groundwater extracted from within the principal aquifer VOC plume would best be treated with air stripping and vapor phase granular-activated carbon to remove VOCs. During air stripping, extracted groundwater flows through a column and air is added. The additional air transforms the VOCs in groundwater to a vapor. VOC vapors pass through granular activated carbon filters trapping the VOCs and clean air is dispersed to the atmosphere. The treated water can then be used for non-potable purposes. Key design parameters for the Site 18 and Site 24 treatment systems were developed using the pilot system.

Design Complete and Construction Underway

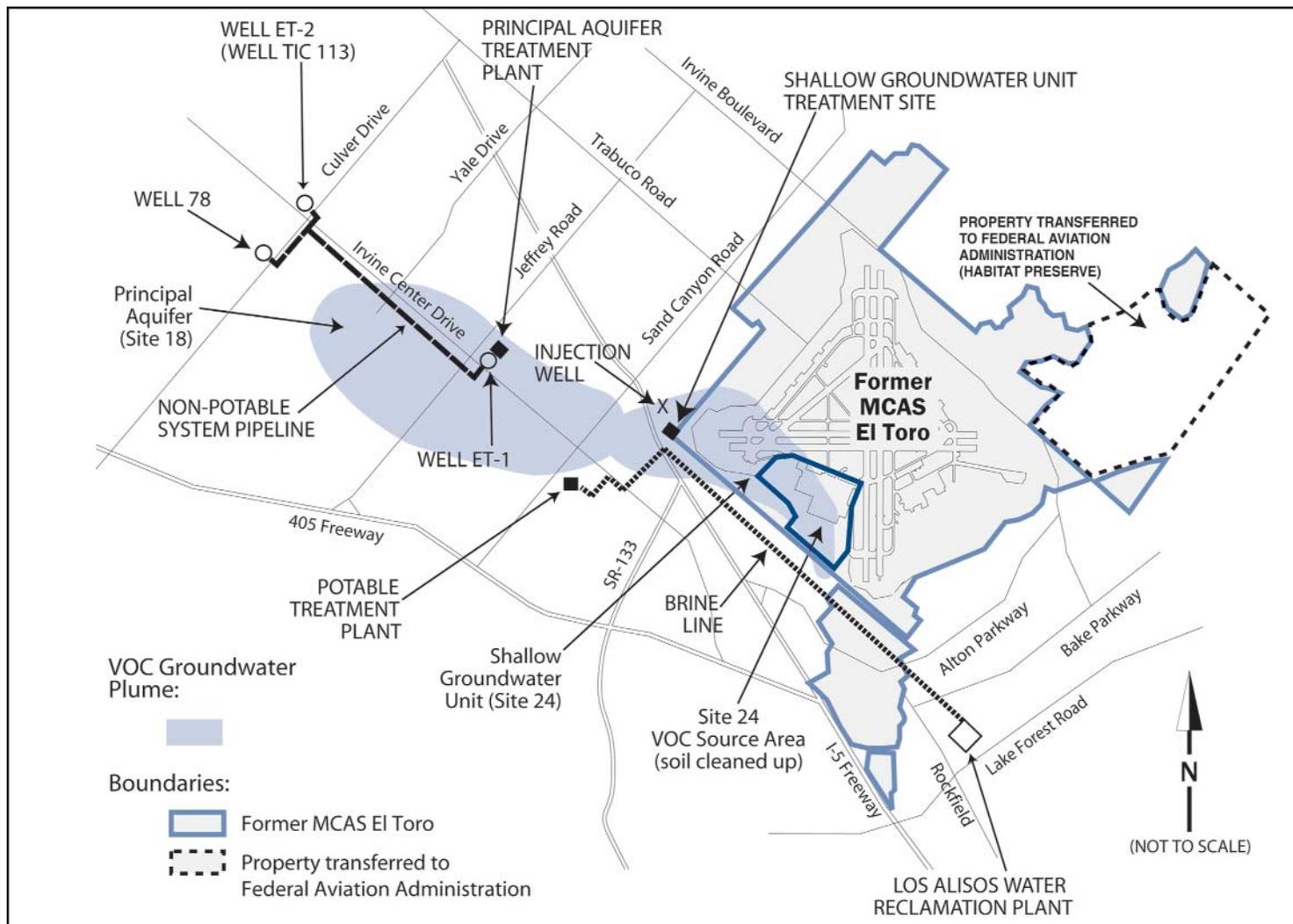
The design for the extraction and conveyance system within Site 24 has been completed and construction activities have been underway since March 2005. A separate engineering design was prepared for the VOC-contaminated groundwater treatment systems for Sites 18 and 24. This design also included the modification of extraction wells and conveyance piping for Site

18. The final engineering design has met with concurrence of the Marine Corps, the Navy, and the regulatory agencies. Cleanup of the Principal Aquifer (Site 18) and Source Area (Site 24) VOC plumes will be accomplished by applying pump and treat technologies using groundwater extraction wells. Descriptions of treatment systems components for the transport and treatment of VOC-contaminated groundwater from Sites 18 and 24 are presented below and the map on page 4 shows the location of system components.

Treatment System for Site 18: The treatment system for Site 18 will extract water from three existing wells (ET-1, ET-2 and Well 78). Well ET-1 is located within the VOC plume. Extracted groundwater from this well will be treated at the well site using a low profile air stripper. The air from the stripper will be treated using vapor phase granular activated carbon prior to releasing it to the atmosphere. Treated water will then be pumped into the IRWD non-potable distribution system. Groundwater at the leading edge of the VOC plume will be extracted from Well ET-2 and Well 78. The amounts of VOCs in these wells are lower than the levels of contaminants allowed in drinking water delivered to users of public water sys-



At Well ET-1, workers are pulling out the existing pump head and well piping as the first step in rehabilitating this well. Well ET-1 will be used to extract VOC-contaminated groundwater.



Site Location Map Sites 18 and 24 - This map shows the VOC plume located in Sites 18 and 24 and the extraction wells, pipelines, and the treatment plants under construction for cleanup of VOC-contaminated groundwater. The complete system is scheduled to go online in July 2006.

systems. Groundwater extracted from these wells will be pumped into the IRWD non-potable distribution system and used for irrigation purposes.

Treatment System for Site 24: This treatment system will treat the groundwater extracted from the shallow groundwater aquifer within Site 24. The treatment system will be connected to the end of the conveyance line recently installed at MCAS El Toro. Similar in design to the system at Site 18, extracted groundwater from this well will be treated using an air stripper. The air from the stripper will be treated using vapor phase granular activated carbon prior to releasing it to the atmosphere. Treated water will either be reinjected into the principle aquifer or transferred to a discharge line for ocean disposal by the South Orange County Wastewater Authority from the Aliso Creek Outfall in Laguna Beach.

Project Schedule

Construction activities for the treatment systems, extraction wells and conveyance systems are on-going. Initial construction activity for the Site 18 and Site 24 treatment systems began in August 2005. The Site 24 treatment system is scheduled for completion in May 2006. Both the Site 18 treatment system and rehabilitation of extraction Well ET-1 is scheduled for completion in June 2006 as they are on the same site. All three extraction wells will be equipped with new pumps and motors. Rehabilitation of extraction Well 78 is scheduled for completion in January 2006. The more extensive modifications at extraction Well ET-2 are scheduled for completion in September 2006. Installation of the conveyance piping, specifically the discharge piping from the SGU treatment system to the reinjection well and to the outfall, is scheduled for completion in May 2006. Both Site 18 and Site 24 systems are expected to be on-line in July 2006.

Project Contacts

If you have any questions or concerns about environmental activities at the former station, please feel free to contact any of the following project representatives:

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Mailing List Coupon

If you would like to be put on the mailing list to receive information about environmental restoration activities at Former MCAS El Toro, please fill out the coupon and send it to Mr. Bob Coleman, Brown and Caldwell, 9665 Chesapeake Drive, Suite 201, San Diego, CA 92123. If you prefer, e-mail the information requested below to rcoleman@brwncald.com

Add me to the MCAS El Toro Installation
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Name _____

Street _____

City _____

State _____ Zip Code _____

Affiliation (optional) _____

INSIDE...

Groundwater Cleanup Update Installation Restoration Program Sites 18 and 24 Former Marine Corps Air Station, El Toro



For More Information

Documents that detail the cleanup of groundwater at Sites 18 and 24 are available at the following locations:

Heritage Park Regional Library
MCAS El Toro Information Repository
14361 Yale Avenue
Irvine, CA 9274
(949) 936-4040

MCAS El Toro Administrative Record File
BRAC Office, Building 307
Former MCAS El Toro
Ms. Marge Flesch
(949) 726-5398

Internet Connection

For more information on Former MCAS El Toro environmental restoration activities, visit the web site at www.navybracpmo.org

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