Fort Ord Drinking Water Quality

Drinking water sources are protected from the contaminated groundwater by institutional controls and engineering controls. Institutional controls include deed restrictions, California State Land Use Covenants (LUCs), Marina Municipal Code, and Monterey County Code, which prohibits construction of water wells within the Prohibition Zone (Figure 4). Engineering controls are the groundwater treatment systems (Figure 5).

The Marina Coast Water District (MCWD) supplies drinking water to City of Marina and former Fort Ord. Drinking water supplied by MCWD meets all Federal, State, and local regulatory standards. Drinking water quality is regularly tested by MCWD and results are reported in an annual Consumer Confidence Report (CCR) found at: www.mcwd.org/ccr.html.

TCE concentrations in drinking water supply wells are at very low levels and are not expected to increase. Groundwater modeling indicates concentrations will remain below drinking water MCLs. Monitoring wells upgradient of supply wells show stable or declining concentration trends. Fort Ord drinking water is safe and protected from the contamination plumes.

Frequently Asked Questions

Is the water safe to drink? Yes. The MCWD regularly monitors drinking water. These results are reported to the California Department of Public Health, and the water quality results are published for the public to see on the MCWD website www.mcwd.org/ccr.html. In addition, the Army also routinely monitors three Ord Community drinking water supply wells used by the MCWD and the results are reported to the regulatory agencies EPA, RWQCB, and DTSC.

Is there contamination in groundwater from former Fort Ord activities? Yes. There is groundwater contamination at four known sites under the former Fort Ord.

Does the contamination affect drinking water supplies? Yes. The Army and the MCWD detected TCE in two water supply wells located in the Ord Community. The amount detected is just above detection limits but well below the MCL. The drinking water meets all federal and state drinking water standards.

What has the Army done to clean up groundwater contamination? The Army has removed or treated the source of the contamination and installed water treatment facilities at all known groundwater contamination sites. The U.S. Environmental Protection Agency (EPA), the California Department of Toxic Substances Control (DTSC), and the Regional Water Quality Control Board (RWQCB) oversee groundwater cleanup programs at the former Fort Ord.

How long will it be before the groundwater cleanup is complete? The Army will continue to treat the known contaminated groundwater sites until COCs are at or below ACLs. Due to the amount of water that must be pumped, the concentrations of contaminants decline slowly over time. While OU1 and Sites 2/12 are expected to meets ACLs in the next few years, removal of sufficient contamination to meet ACLs, at the remaining two plumes, could take up to 30 years.

Fort Ord Groundwater Cleanup Contact Information

Fort Ord Administrative Record Bldg. 4463, Room 101, Gigling Road, Ord Military Community, (831) 393-9693

California State University Monterey Bay (CSUMB) Tanimura & Antle Family Memorial Library Circulation Desk, Bldg. 508, First Floor, Divarty Street, Seaside, (831) 582-3733, http://library.csumb.edu/

Seaside Branch Library 550 Harcourt Ave, Seaside (831) 899-2537

U.S. Army, Fort Ord Base Realignment and Closure (BRAC) Office William Collins, BRAC Environmental Coordinator, (831) 242-7920, William.K.Collins.civ@mail.mil or Melissa Broadston, Community Relations, (831) 393-1284, Melissa.M.Broadston.ctr@mail.mil

U.S. Environmental Protection Agency (EPA), Region IX Martin Hausladen, Remedial Project Manager, (415) 972-3007, Hausladen.Martin@epa.gov

California EPA Department of Toxic Substances Control (DTSC) Franklin Mark, Remedial Project Manager, (916) 255-3584, Franklin.Mark@dtsc.ca.gov

California EPA Regional Water Quality Control Board (RWQCB) Grant Himebaugh, Remedial Project Manager, (805) 542-4636, GHimebaugh@waterboards.ca.gov

www.FortOrdCleanup.com

Para obtener una copia en español, llame al (831) 393-1284

Fort Ord Groundwater

Contents:

Groundwater Definitions

Groundwater— All water under the ground, not water on the surface (rivers, lakes, etc.).

Aquifer—A body of rock or soil that is sufficiently permeable for groundwater to flow and serve as a water source.

Water Table—Depth below the ground surface at which groundwater is found.

Aquitard—A body of less permeable rock or soil between aquifers that retards the flow of water between the aquifers.

COCs—Chemicals Of Concern (present in groundwater).

MCL—Maximum Contaminant Level, the maximum allowable concentration of a chemical in drinking water.

ACL—Aquifer Cleanup Level, the cleanup goal for a COC in groundwater identified in a Record of Decision (typically the same as the MCL or lower).

Plume—Area of aquifer in which COCs are present at concentrations greater than the ACL.

OU—Operable Unit, discrete portion of remedial response that manages migration, or eliminates or mitigates a pathway of exposure.

TCE—Trichloroethene, primary COC at OU1, OU2, and 2/12.

CT—Carbon tetrachloride, primary COC at OUCTP.

Figure 1

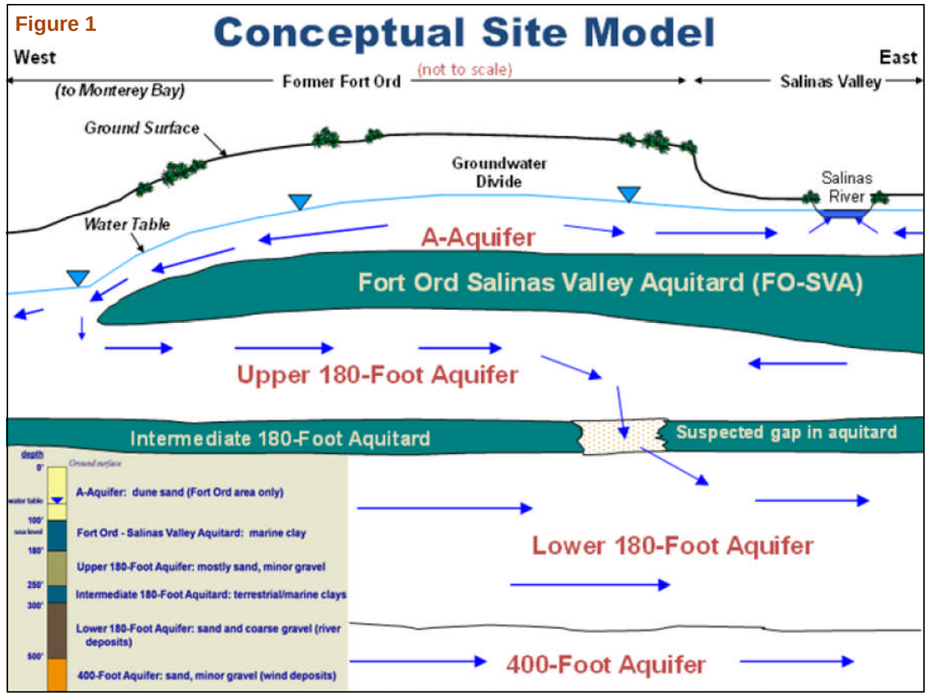


Figure 1: The Conceptual Site Model describes the conditions of the groundwater beneath the former Fort Ord. There are four aquifers (A-Aquifer, Upper 180-Foot Aquifer, Lower 180-Foot Aquifer, and the 400-Foot Aquifer). There are two aquitards (FO-SVA and the Intermediate 180-Foot Aquitard).

Groundwater flow in the A-Aquifer splits at the groundwater divide and goes toward the Salinas River and Monterey Bay, and enters the Upper 180-Foot Aquifer at the edge of the FO-SVA. Groundwater may also be entering the Lower 180-Foot Aquifer through a suspected gap in the Intermediate 180-Foot aquitard.

Groundwater Monitoring

The Army and regulatory agencies have identified four areas on the former Fort Ord where chemical releases associated with past Army activities have contaminated groundwater. These four areas are identified as Operable Unit 1 (OU1), Operable Unit 2 (OU2), Sites 2 and 12 (2/12) and Operable Unit Carbon Tetrachloride Plume (OUCTP). TCE is the main COC at three of the sites and CT is the main COC at OUCTP.

The Army has installed an extensive monitoring well network (Figure 2) to identify the COC plume boundaries in the affected aquifers and determine the flow rates and directions of the affected groundwater. As groundwater contamination is cleaned up, monitoring wells meeting the criteria shown in Figure 3 may be destroyed.

Figure 2

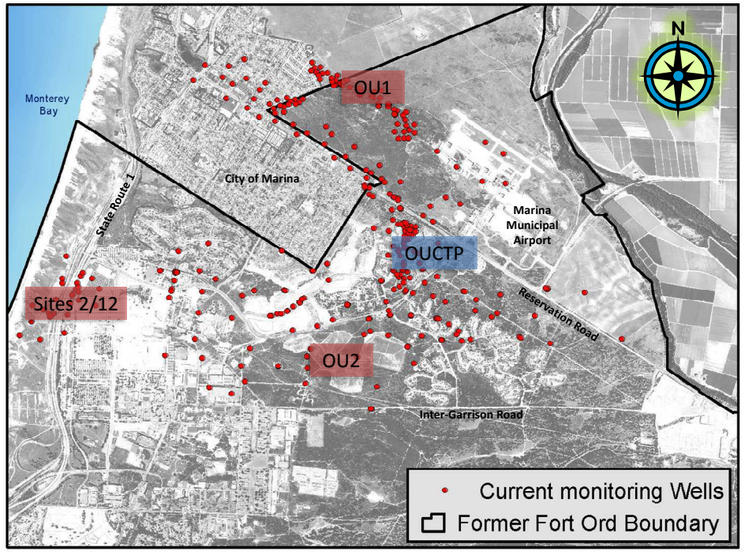


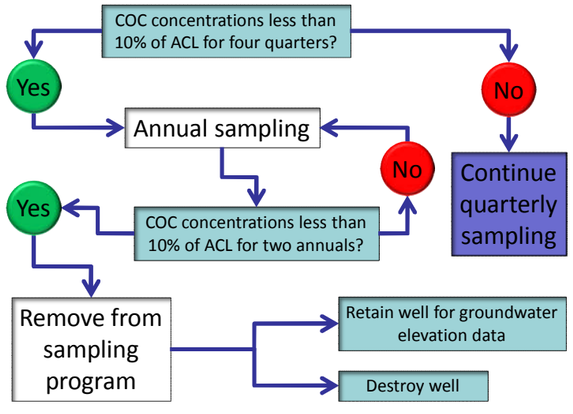
Figure 2 (above right): The monitoring well network in each of the four contamination areas OU1, OU2, OUCTP, and Sites 2/12.

Figure 3 (below): Monitoring well decision rules flow chart to determine sampling frequency and possible removal and well destruction.

Figure 4 (right): Institutional controls include the Prohibition Zone (overlying the plumes) and the Consultation Zone (adjacent to the plumes).

Figure 3

Well Status Decision Rules



Groundwater Contamination and Treatment

The Army built several groundwater treatment facilities that pump contaminated groundwater from the aquifers, remove contamination, and inject the treated groundwater back into the aquifer. The groundwater will continue to be treated until the COCs are below the ACLs. The four contaminated sites and their treatment remedies are described below.

OU1—Contaminated groundwater caused by a former fire-fighting training area near the Marina Municipal Airport (former Fritzsche Army Airfield). The training area was closed in 1985 and all structures removed. The primary COC is TCE, which is an industrial solvent used for degreasing, dry cleaning, and mechanical parts cleaning. The Army removed contaminated soil in 1988. Currently, groundwater is extracted and treated with granular activated carbon (GAC), which acts like a large water filter by adsorbing the contamination from the water. The treated water is then re-injected into the aquifer through injection wells and infiltration galleries.

OU2—A closed landfill south of the corner of Imjin Parkway and Abrams Road caused groundwater contamination from chemicals improperly disposed of in the landfill from the 1950s until 1987. The Army placed an impermeable cover over the landfill to keep rainwater from reaching the buried materials. The Army also installed a landfill gas extraction and treatment system to remove methane gas and COCs. TCE is the main COC and groundwater extraction from the A-Aquifer and the Upper 180-Foot Aquifer and treatment with GAC began in 1995. Treated water is re-injected into the aquifer through injection wells and infiltration galleries.

Sites 2/12—A former truck and auto maintenance facility in the current location of "The Dunes on Monterey Bay" shopping center south of Imjin Parkway and directly east of Highway 1 caused groundwater contamination from improperly disposed solvents. Contaminated soil was removed in the 1990s. TCE is the main COC and groundwater extraction and treatment with GAC began in 1999. Treated water is re-injected into the aquifer through injection wells and infiltration galleries.

OUCTP—Groundwater located north of the corner of Imjin Parkway and Abrams Road and along Reservation Road in Marina was contaminated from a suspected chemical spill site near Lexington Court. CT is the main COC and groundwater remediation includes enhanced in-situ bioremediation (A-Aquifer), groundwater extraction and treatment with GAC (Upper 180-Foot Aquifer), and monitored natural attenuation with wellhead treatment contingency (Lower 180-Foot Aquifer). Remediation began in 2009 for the A-Aquifer and 2011 for the Upper and Lower 180-Foot Aquifers.

Figure 4

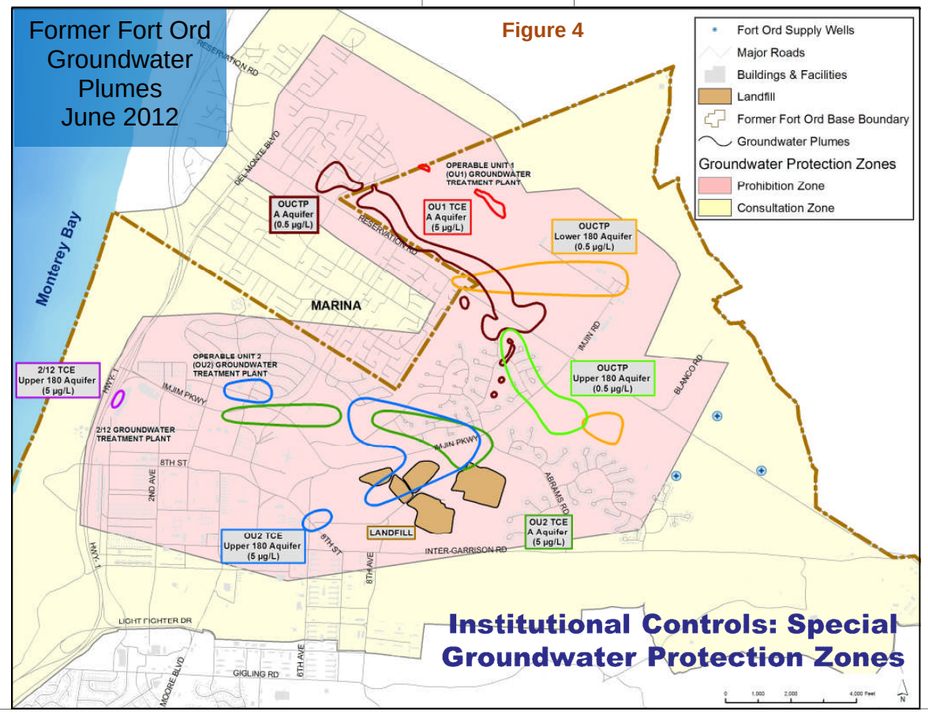


Figure 5 (below): Groundwater remediation by groundwater extraction and treatment with GAC is the engineering control applied at the site. The treatment systems are optimized to improve efficiency. Optimization includes reviewing sampling data, treatment technologies, and modeling pumping configurations.

Figure 5