

## Tucson Airport Remediation Project (TARP)

[Part of the Tucson International Airport Area (TIAA) [EPA CERCLA Site](#)]

### Boundaries:

The northern [operable unit](#) of the Tucson International Airport Area (TIAA) [Comprehensive Environmental Response, Compensation and Liability Act](#) (CERCLA) Site contains a groundwater [pump and treat](#) system, and this project area is known as [TARP](#). The TIAA Site is on the [National Priorities List](#) (NPL), which is periodically updated by the [U.S. Environmental Protection Agency](#) (EPA). This portion of the main plume extends from Los Reales Road northward just past Irvington Road in Tucson, Arizona. It is bounded on the west by Interstate 19 and the Santa Cruz River, and on the east by S. 6th Avenue and Nogales Highway (Route 89).

### Site Status Update:

TARP is in the [operation and maintenance](#) phase of cleanup, and consists of a remediation well field and a groundwater treatment plant. The remediation well field includes a South Well Field (SWF) of five [extraction wells](#), and a North Well Field (NWF) of four extraction wells. Piping from these extraction wells goes to the [air stripping](#) groundwater treatment plant. The TARP system provides hydraulic control and remediation of Area A of the TIAA Superfund Site Regional [Aquifer](#). Together, the nine wells pump an average of about 3,481 gallons per minute. The TARP system was started in September 1994 and has pumped/treated over 35.6 billion gallons of groundwater. To date, approximately 4,334 lbs. of [trichloroethene](#) (TCE) have been removed from the Regional Aquifer. Clean water from the TARP treatment plant is delivered to the [Tucson Water Department](#) (Tucson Water) distribution system.



**TARP Groundwater Treatment Plant**

The United States Air Force (Air Force) is working on Phase II of a [1,4-dioxane](#) Focused [Remedial Investigation](#) (FRI). The purpose of the FRI is to further define the nature and extent of 1,4-dioxane in the groundwater within the TIAA Superfund Site Area A and at [Air Force Plant-44](#) (AFP-44).

Tucson Water operates the TARP treatment plant in accordance with the Federal Safe Drinking Water Act regulations. Neither a [Maximum Contaminant Level](#) (MCL) nor an [Aquifer Water Quality Standard](#) (AWQS) standard for 1,4-dioxane has been developed yet. However, EPA Region 9 has a [Regional Screening Level](#) of 0.35 parts per billion (ppb).

## Community Involvement Activities:

To provide community members with an opportunity to learn about the cleanup process and to obtain local perspective for decisions concerning the cleanup, a [Unified Community Advisory Board](#) (UCAB) was formed in 1995. The UCAB meets the third Wednesday of January, April, July, and October. These meetings occur at 6:00 p.m. at the El Pueblo Activity Center located at 101 W. Irvington Rd. in Tucson and are open to the public.

The U.S. Air Force publishes a [semi-annual progress report](#) for activities at AFP-44, which is [upgradient](#) (south) of TARP.

## Site History:

**1950s-1970s:** Historic industrial and defense related activities resulted in the release of hazardous wastes into the groundwater leading to extensive contamination of the regional aquifer. The source of contamination for the TARP plume was AFP-44 and the Airport Property Project Area (Airport Property) areas of TIAA.

**1983:** The TIAA Site was placed on the NPL on [September 8](#).

**1985:** An RI, which characterized the extent and concentration of contaminants in the TARP groundwater plume, was completed by the [Arizona Department of Health Services](#).

**1988:** A [feasibility study](#) (FS) was completed and the EPA issued a site-wide [Record of Decision](#) (ROD) for [volatile organic compounds](#) (VOCs) contaminated groundwater.

**1994:** The TARP groundwater remediation system, including extraction wells, treatment plant, and associated piping, was completed.

**2002:** During the spring and summer, 1,4-dioxane up to approximately 12 ppb was discovered in the TARP project area. The 1,4-dioxane was thought to have originated from AFP-44.

**2004-2005:** In 2004, EPA asked Tucson Water and TARP representatives to begin a new RI/FS to evaluate 1,4-dioxane contamination and what remediation technology (if needed) would be applicable. However, in 2005 the U.S. Air Force agreed to conduct the RI/FS with cooperation from Tucson Water, the [Tucson Airport Authority](#), and TARP.

**2007:** EPA initiated further discussions with the Air Force about conducting a new RI to focus on 1,4-dioxane contamination north of the Air Force Plant #44 boundary. The RI process will help determine if additional groundwater [monitor wells](#) are needed to confirm continued TCE plume capture, and to further characterize the 1,4-dioxane plume. Tucson Water uses a groundwater model to evaluate plume capture.

**2008:** The Air Force completed the Phase I focused RI for 1,4-dioxane contamination north of Los Reales road which includes the TARP area. The Phase I investigation included data acquisition and management, review of historical reports and models for, and evaluation of 1,4-

dioxane water quality data collected by the [U.S. Geological Survey](#). The [City of Tucson](#) (COT) continued to operate the TARP well field to minimize the amount of 1,4-dioxane entering the public water system.

**2009:** The Air Force submitted to the agencies a Phase II Focused RI of 1,4-Dioxane Work Plan which includes the TARP area. The work plan included a summary of existing data, planned field investigations, and a groundwater modeling work plan.

Tucson Water completed a technical memorandum in which ozone-peroxide and ultraviolet light (UV)-peroxide advanced oxidation processes (AOPs) were tentatively identified as the best available technologies for 1,4-dioxane treatment. The information obtained from this research would be evaluated through pilot testing.

**2010:** Tucson Water conducted pilot testing of ozone-peroxide and UV-peroxide advanced oxidation treatment for 1,4-dioxane. This pilot testing demonstrated that both technologies could effectively treat 1,4-dioxane. In addition, both technologies effectively treated TCE and 1,1-dichloroethene (1,1-DCE). Tucson Water concluded that UV-peroxide is their preferred technology.

Several activities, performed as part of the Phase II Focused Remedial Investigation (FRI), were completed by the Air Force. The results of these activities further defined the nature and extent of 1,4-dioxane in the groundwater within TARP and at AFP-44. These activities included: documenting potential sources of 1,4-dioxane; compiling and reviewing existing information related to 1,4-dioxane in groundwater; and identifying data gaps in defining the extent of the 1,4-dioxane contamination in the Regional Aquifer throughout both TARP and AFP-44.

### **Contaminants:**

The current contaminants of concern in groundwater include [VOCs](#), mainly [trichloroethene](#) (TCE). TCE concentrations range from non-detect to around 100 ppb. Additionally, in 2002, [1,4-dioxane](#) concentrations of up to approximately 12 ppb were discovered in the TARP project area. Contaminants of concern at the site may change as new data become available.

### **Public Health Impact:**

The [COT](#) is the main municipal water provider at TIAA. All municipal wells in the area that were contaminated with TCE have been shut down. Most of the domestic wells have either been shut down or converted to irrigation wells. However, a few residents with domestic wells with low levels of TCE and 1,4-dioxane have chosen to continue using their wells. If you are drinking water from a private well within the boundaries of TIAA, please contact the ADEQ Project Manager. Additionally, low levels (less than 2.0 ppb) of 1,4-dioxane are being delivered to municipal water consumers who receive their water from the TARP plant. [An MCL or AWQS for 1,4-dioxane has not yet been developed. However, EPA has a drinking water advisory level of 3.0 ppb.]

## Site Hydrogeology:

The TARP project area is located in the northwestern portion of the TIAA Site. In the southern half of the project area, the regional aquifer is composed of two hydrostratigraphic units: the upper zone of the regional aquifer and the lower zone of the regional aquifer. The regional aquifer in the northern portion of the project area is composed of only one hydrostratigraphic unit called the undivided regional aquifer.

The upper zone of the regional aquifer is composed mainly of gravelly sand with some clayey sand and sandy clay, and it extends to a depth of about 200 feet below ground surface (bgs). The lower zone of the regional aquifer is composed mainly of relatively finer materials, including clayey sand with lenses of gravelly sand and sandy clay; it extends from about 300 feet bgs to an unknown depth. Separating the upper and lower zones of the regional aquifer is a thick clayey sequence termed the middle [aquitard](#). This unit generally prevents contamination in the upper zone from reaching the lower zone.

The undivided regional aquifer (in the northern part of TARP) is composed mainly of coarse-grained materials.

Depth to groundwater in the TARP project area varies from 80 to 240 feet bgs and generally gets deeper in a northward direction. The general groundwater flow direction is toward the north-northwest. More detailed descriptions of the hydrogeology of the TARP project area can be found in reports and studies available at the TIAA Information Repository.

## Contacts:

Name	Phone/Fax	E-Mail
Marc Herman, ADEQ Project Manager	(520) 628-6740*/ (520) 628-6745 fax	<a href="mailto:herman.marc@azdeq.gov">herman.marc@azdeq.gov</a>
Richard Muza, EPA Remedial Project Manager	(415) 972-3349**/ (415) 947-3526 fax	<a href="mailto:muza.richard@epa.gov">muza.richard@epa.gov</a>
Leana Rosetti, EPA Community Involvement Coordinator	(415) 972-3070**/ (415) 947-3528 fax	<a href="mailto:rosetti.leana@epa.gov">rosetti.leana@epa.gov</a>

\*In Arizona, but outside the Tucson area, call toll-free at (888) 271-9302.

\*\*Call EPA's toll-free message line at (800) 231-3075.

## Information Repository:

Interested parties can review select site documents at the TCE Superfund Information Library located at 101 W. Irvington Road, within the [El Pueblo Branch Library](#) in Tucson, (520) 594-5250. The complete official site file can be reviewed at the EPA Region IX, [Records Center](#), Mail Stop SFD-7C, 95 Hawthorne Street, Room 403, San Francisco, CA 94105, (415) 536-2000.

The ADEQ site file is located in Phoenix at the ADEQ Central Office at 1110 W. Washington Street; however, select documents are also available in Tucson at the Southern Regional Office

at 400 W. Congress, Suite 433. Please call (520) 628-6715 or toll-free (888) 271-9302 to arrange a file review appointment at the Southern Regional Office.

To arrange for a time to review the site file at the main ADEQ Phoenix office, please call the ADEQ Records Management Center with 24-hour notice at (602) 771-4380 or (800) 234-5677. Once all documents requested have been collected, you will be contacted for a review Monday through Friday from 8:30 a.m. to 4:30 p.m. at the ADEQ Records Management Center, 1110 W. Washington Street in Phoenix, AZ.