

## **20th Street and Factor Avenue**

### Water Quality Assurance Revolving Fund ([WQARF](#)) Site

#### **Boundaries:**

The 20th Street and Factor Avenue Site (Site) is located approximately one-half mile south of 16th Street (U.S. Highway 95) and approximately three-quarters of a mile east of Fourth Avenue (Interstate 8 Business Loop) in Yuma, Arizona.

The plume boundaries depicted on the [Site map](#) represent the Arizona Department of Environmental Quality's (ADEQ) interpretation of data available at the time the map was constructed. The map is intended to provide the public with basic information as to the estimated extent of known contamination as of the date of map production. The actual extent of contamination may be different. Therefore, the plume may change in the future as new information becomes available.

#### **Site Status Update:**

ADEQ continues to investigate the Site to identify the extent of the groundwater contamination. A shallow [soil vapor](#) investigation was performed to help identify potential source areas. Additional soil vapor and groundwater sampling will be conducted during the first quarter of 2011.

#### **Community Involvement Activities:**

ADEQ distributes fact sheets and public notices to the nearby community when significant events occur.

#### **Site History:**

**1966-1988:** [Houston Photo Products](#) (HPP) operated a motion picture laboratory and a facility which also manufactured photographic film and paper processing equipment for the photo industry. In 1988, HPP changed its name to Houston International, Limited (HIL). The chemicals used at the facility include standard photographic chemicals, namely [tetrachloroethene](#) (PCE), small amounts of various other photographic chemicals and water. The wastewater at the facility was treated to recover silver. The treated wastewater was disposed in three ways:



**Uncovering a Septic System at the  
Houston Facility**

- 1) Some of the wastewater was discharged to a 1,000-gallon concrete underground [sump](#) on the east side of the property. When this sump was full, it was discharged to a disposal pond on the east side of the property. Wastewater from this disposal pond overflowed onto the adjacent property to the east of the Site.
- 2) Wastewater was used to water plants in landscaped areas at the front of the building.
- 3) Wastewater was discharged to the ground in the southwest portion of the property by a sprinkler system and later to a sump.

Beginning in 1975, HPP/HIL used PCE to clean stainless steel machine parts. On one occasion in 1978, PCE was discharged to the 1,000-gallon concrete underground tank.

**1990-1995:** HIL reported a leaking tank to the ADEQ [Underground Storage Tanks](#) (UST) Section. The ADEQ UST Section referred the facility to the ADEQ [Water Pollution Compliance Unit](#). Consultants for HIL conducted soil and groundwater investigations under the oversight of the Water Pollution Compliance Unit.

In 1990, PCE and metals were detected in on-site soils. Subsequent soil investigations indicated that PCE was present in soil at concentrations below the Arizona residential [Soil Remediation Level](#) (SRL) of 53,000 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ). In 1991, HIL began to use Industroclean (which contains [ethylene glycol monobutyl ether](#)) in place of PCE. Consultants for HIL installed three groundwater [monitor wells](#) (MW-1, MW-2, and MW-3) and performed groundwater sampling in 1993. The PCE concentrations exceeded the Arizona [Aquifer Water Quality Standard](#) (AWQS) for PCE of 5.0 micrograms per liter ( $\mu\text{g}/\text{l}$ ).

Also in 1993, the ADEQ [Hazardous Waste Section](#) (HWS) inspected the facility, and in 1994, HIL and the ADEQ HWS entered into a compliance order. Consultants for HIL conducted additional soil and groundwater investigations under the compliance order. In 1994, a [soil vapor](#) survey was conducted. Elevated concentrations of PCE were present in the soil vapor samples. [Trichloroethene](#) (TCE) and 1,1,1-[trichloroethane](#) were also detected in soil vapor samples. HIL moved its motion picture laboratory operation off-site. The facility is currently occupied by the offices of Houston Film Labs and a dance studio. This operation does not generate wastewater.

**1996:** One nested groundwater monitoring well (MW-102) and one [upgradient](#) monitor well (MW-101) were installed at the Site. The maximum PCE concentration detected was 520  $\mu\text{g}/\text{l}$  in MW-2 at 140 to 150 feet below ground surface (bgs).

**1998-2000:** In 1998, the ADEQ Hazardous Waste Section referred the facility to the ADEQ Superfund Programs Section, [Site Assessment Unit](#). The Site was placed on the [WQARF Registry](#) in March 2000 with a score of 31 out of a possible 120.

**2001:** ADEQ began Site investigation activities at the facility. A review of the Material Safety Data Sheets of the chemicals used at the facility indicated that two cyanide compounds, [potassium ferricyanide](#) and [sodium thiocyanate](#), were also used at the facility. Both of the cyanide compounds used at the facility can degrade to hydrogen cyanide in sunlight or in an

environment with a near neutral pH. Analyses of wastewater in the septic systems indicated that elevated cyanide concentrations were present in the wastewater disposal system. [Cyanide](#) was also detected in groundwater samples above the AWQS of 0.2 milligrams per liter (mg/l).

ADEQ completed the characterization of cyanide-contaminated soils at the Site. Several areas on the Site exceed the non-residential SRL of 35 milligrams per kilogram (mg/kg) for hydrogen cyanide.

**2002:** ADEQ completed an [early response action](#) (ERA) at the Site which included excavation and disposal of the upper foot of cyanide-contaminated surface soils. Approximately 1,700 tons of contaminated soils were removed from the Site. A one-foot [cap](#) of aggregate base coarse material was placed over the remaining cyanide-contaminated soils. This cap helps prevent direct exposure to the underlying contaminated soils remaining at the Site. The ERA also included the removal of two unused sumps and the cleaning of three active septic systems at the Site. Approximately 15,000 gallons of PCE and cyanide-contaminated wastewater and [sludge](#) were removed from the disposal system during cleaning operations. The removal of this source material addressed a continuing source of groundwater contamination.

**2003:** Soil and soil vapor samples were collected from six [borings](#) at the Site. Samples were collected to evaluate the vertical extent of PCE contamination. Sampling results indicated that the concentrations of PCE remaining in the soil did not exceed regulatory standards.

**2004:** ADEQ collected indoor air data from the buildings on the property and one building adjacent to the property. This data was collected as part of an ongoing risk assessment of the indoor air at the Site. ADEQ also drilled and sampled four deep borings beneath two of the remaining septic tanks and the former disposal pond area. The purpose of these borings was to evaluate the cyanide contamination at depth in these areas. Cyanide contamination above the non-residential SRL extends to a depth of approximately 17 feet bgs in some areas of the Site. ADEQ used these data and other information to develop groundwater protection levels for the cyanide contaminated soils remaining in place.

Also, ADEQ drilled and sampled two deep groundwater monitor wells at the Site. Analysis of groundwater samples from these deep wells did not indicate PCE or cyanide contamination above an AWQS.

**2005-2006:** ADEQ drilled and sampled ten additional groundwater monitor wells to further define the extent of the contaminant plume. Laboratory analyses from these monitor wells indicate that the contaminant plume extends approximately ½ mile [downgradient](#) of the Site. The lateral extent of the plume has not yet been fully characterized.

**2007:** Installation of additional deep groundwater monitor wells indicated that groundwater was present in three distinct zones: shallow (50 to 90 feet bgs); middle (105 to 170 feet bgs) and deep (starting at 170 feet bgs). Each zone is divided by separate clay units. Groundwater samples from each zone indicated that the majority of the contaminant plume was located within the middle zone.

**2008:** ADEQ installed one groundwater [extraction well](#) in the middle of the contaminant plume. An [aquifer](#) test was completed to determine aquifer characteristics. The last remaining septic

system on the HIL property was taken out of service and replaced with a new system and leach field located away from contaminated soil. Additional information was gathered north of the HIL property to locate potential sources areas.

**2009:** A shallow soil vapor investigation was performed to help identify potential source areas. The soil vapor investigation included the installation of several permanent soil vapor monitor probes and performing a soil vapor survey.

**2010:** In November, additional permanent soil vapor monitor probes were installed to help identify potential source areas. Results of the soil vapor investigation will be pending following the collection of samples in the First Quarter of 2011.

### **Contaminants:**

The current contaminants of concern at the Site include [tetrachloroethene](#) (PCE), [trichloroethene](#) (TCE) and [cyanide](#). Contaminants of concern at the Site may change as new data become available.

### **Public Health Impact:**

No irrigation, drinking water or [City of Yuma](#) production wells have been impacted by the [volatile organic compounds](#) or cyanide contamination from the Site. However, PCE, TCE and cyanide are present in the groundwater monitor wells at the Site at concentrations above the AWQS. A soil cap prevents direct exposure to the underlying cyanide contaminated soils remaining at the Site.

The City of Yuma is the main municipal water provider at this Site. No one is known to be drinking contaminated water from this Site. However, if you are drinking water from a private well within the boundaries of the Site, please contact the ADEQ Project Manager.

### **Site Hydrogeology:**

The Yuma area is underlain by thick sequences of non-marine and marine sedimentary rocks. However, only the upper several hundred feet of these sediments are hydrologically important. This is because the upper layers are extremely transmissive and yield sufficient quantities of water to wells.

From lowest to uppermost, the upper layers are described as the wedge zone, the coarse gravel zone, and the upper fine-grained zone. The wedge zone overlies the marine sedimentary Bouse formation and consists of interbedded sands, gravels and cobbles. The wedge zone is approximately 2,500 feet thick in the area and pinches out against the basin bounding ranges.

The coarse gravel zone overlies the wedge zone, varying from zero to 100 feet in thickness. The coarse gravel zone consists of fluvial deposits of coarse gravels, including cobbles and boulder size material. The coarse gravel zone is the principal aquifer for the Yuma area. The coarse gravel zone is generally found at a depth of 100 feet in the low lying valley areas near the Site,

and at a depth of about 180 feet below the Yuma Mesa where the Site is located. However, the coarse gravel zone is not present beneath the Site.

The upper fine-grained zone is the uppermost saturated unit which overlies the coarse gravel zone. The upper fine-grained zone is up to 200 feet thick and is characterized as sands and silts and may have an extensive clay layer which can locally affect groundwater movement. The Yuma Mesa is a remnant of the upper fine-grained zone which is mostly missing in the nearby low lying valley areas.

Depth to groundwater at the Site is approximately 75 feet below ground surface (bgs). Groundwater flow direction at the Site is generally to the northwest.

**Contacts:**

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

**Information Repository:**

The complete official 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. Files are available for review Monday through Friday from 8:30 a.m. to 4:30 p.m. 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.