Cooper Road and Commerce Avenue

Water Quality Assurance Revolving Fund (WQARF) Site

Boundaries:

The Cooper Road and Commerce Avenue WQARF Site (Site) consists of a contaminated groundwater plume located in the vicinity of Commerce Avenue near Cooper Road in Gilbert, Arizona. The plume is bounded to the north by W. Encinas Street, to the south by the Neely Ranch Preserve, to the east by the N. Neely Street and to the west by N. Ocotillo Drive.

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:

In July 2010, ADEQ completed construction of the treated groundwater conveyances to the Town of Gilbert sanitary sewer system and the Salt River Project's lateral 9.5 located directly south of the Site. Initial startup of the groundwater pump and treat system began on August 2, 2010 and continuous automated operations began on August 25, 2010. During the first four months of operation, the pump and treat system pumped and treated approximately 16,802,000 gallons of groundwater and removed approximately 12 pounds of tetrachloroethene (PCE).

In November 2010, ADEQ installed an additional soil vapor extraction well where previous sampling indicated a likely surface spill of PCE had occurred. The new soil vapor extraction well is currently being connected to the treatment system.

ADEQ continued to operate and maintain the soil vapor extraction and air sparge (SVE/AS) system. During this time, approximately 750 pounds of PCE and trichloroethene (TCE) were recovered.

Groundwater monitoring of wells near the extraction well was conducted in 2010 to determine the effectiveness of the pump and treat system. Results of this monitoring are expected in early 2011. In addition, the entire monitor well network at the Site was sampled twice this year to monitor the extent of the plume.

A Drilling Rig Installing a Monitor Well

Community Involvement Activities:

A community advisory board (CAB) was formed and first met on June 14, 2006. Details of meeting agendas and minutes for 2010 and 2011 can be viewed at the ADEQ Web site. These meetings are open to the public. The most recent fact sheet can be found on the ADEQ Web site.

Site History:

1977: Unichem (aka United Chemical Corporation) purchased the Site and constructed facilities for the production of copper sulfate from scrap metal. A drywell was constructed to a depth of 79 feet on Site. The drywell was located near the center of the concrete pavement that served as a foundation for the processing plant. The copper sulfate production process used aqueous ammonia, lix (a petroleum-based compound) blended with kerosene, and sulfuric acid to extract copper from the scrap metal. A diesel fired boiler with heat exchangers was used to heat the process stream before the crystallization of the copper sulfate. PCE was reportedly used to manufacture a coolant, possibly used in the crystallization process.

1983-1984: Unichem discontinued operations at the Site prior to 1983. In July, 1983, Unichem sold the property to Aztec Resources, which operated a gold extraction plant at the Site. The process reportedly used cyanide baths to extract gold from scrap materials and mine tailings. In September 1984, Aztec Resources defaulted on their payment and the property was reacquired by Unichem.

1989: There have been several phases of investigations at the Unichem Site. Operations on the eastern portion of the Site, parcel 302-15-025B, were investigated by the ADEQ hazardous waste inspections unit. Several shallow soil samples were collected from the property. Samples collected from the sump of the drywell detected cyanide above the residential soil remediation level (SRL) for hydrogen cyanide of 11 milligrams per kilogram (mg/kg). Arsenic, lead and copper were also present above the respective residential SRLs of 10, 400 and 2,800 mg/kg.

1990: Geraghty and Miller, Inc. collected soil samples from a depth of twelve inches at two locations on the western portion of the Site, Parcel 302-15-025A. Analytical results indicated arsenic was present above the SRL. PCE and copper were also detected, but below residential SRLs. A soil vapor survey was also conducted indicating high concentrations of PCE were present in the soil vapor on the east side of this parcel at a depth of four to five feet below ground surface (bgs). A deep boring on the eastern side of this parcel detected PCE above the residential SRLs of 53 mg/kg at depths of five and 20 feet bgs. Total petroleum hydrocarbons (TPH) were also detected in the deep borings at this property which may have been related to the diesel fired boiler.

Simon-EEI Inc., collected soil samples from 24 boring on the eastern portion of the Unichem Site. No concentrations were detected above residential SRLs but quality assurance/quality control concerns exists with the volatile organic compound (VOC) data because soils were collected in glass jars and volatilization of the contaminants may have occurred before analysis. PCE was detected in 11 of the borings. 1,1,1-Trichloroethane (1,1,1-TCA) was detected in five borings. TPH was detected in 14 borings. Arsenic was detected in all borings but may be at

concentrations near normal background. Elevated copper concentrations were detected in boring #24, near the drywell, at depths of five and twenty feet bgs.

1994: Early in the year, cyanide contaminated soils in the area of the drywell were removed to a depth of three feet and disposed by HYDRO-SERCH, Inc. HYDRO-SEARCH, Inc. installed three groundwater monitor wells at the Site. Soil samples were collected approximately every five feet until the water table was encountered at approximately 130 feet bgs. Arsenic, chromium and lead were detected above residential SRLs. No minimum groundwater protection levels (GPLs) were exceeded in the soil samples. Groundwater samples detected PCE above the Aquifer Water Quality Standard (AWQS) of 5.0 micrograms per liter (µg/l). Groundwater samples were also analyzed for cyanide, benzene, ethyl benzene, toluene, xylene and TPH but were not detected. Arsenic and barium were detected in the groundwater samples but below their AWQS.

HYDRO-SEARCH, Inc. drilled an exploratory boring to a depth of 99 feet bgs within the on-site drywell. The drywell was constructed with a sediment chamber formed with concrete rings to a depth of approximately 10 feet bgs. The drywell was apparently constructed with a drainage chamber containing gravels to a depth of 42 feet bgs. Native soils were apparently encountered at a depth of approximately 50 feet. During drilling, soil samples were collected every five to ten feet. Arsenic, chromium, TPH and mercury were detected above residential SRLs. PCE was detected above residential SRLs and the minimum GPL of 1.3 mg/kg with concentrations as high as 24,000 mg/kg. HYDRO-SEARCH, Inc. intended to conduct vapor extraction on the drywell and backfilled the boring to a depth of 50 feet bgs and installed a slotted 50 foot section of PVC screen. No vapor extraction was conducted at the Site.

1996: Groundwater monitoring at the Site continued 1996 and PCE was detected at concentrations as high as 6,600 µg/l in monitor Well MW-101 located north of the drywell. During monitoring, the direction of groundwater flow varied from easterly to westerly at the Site.

2001: Groundwater samples collected from a Town of Gilbert monitor well (G-9) located just east of Cooper Road approximately 1,600 feet northwest of the Site, detected PCE at concentrations above the AWQS. Subsequent monitoring has also detected TCE above the AWQS of 5.0 µg/l.

2002: ADEQ sampled MW-102, west of the drywell, and MW-103, south of the drywell. At this time, the upper portion of the casing of MW-101 was found to be damaged and no groundwater sample could be collected. The concentrations of PCE in groundwater samples from the two monitor wells were well above the AWQS.

2003: ADEQ installed two additional monitor wells north of monitor well G-9. MW-104S was installed just east of Cooper Road approximately 1,900 feet northwest of the Site and was screened from 115 to 165 feet. This screened interval is equivalent to the other monitor wells located on the Site. PCE concentrations in groundwater samples from this monitor well are usually above the AWQS. TCE concentrations have also been detected above the AWQS. MW-104D was installed at the same location and screened in a sand zone from 580 to 610 feet. This zone is equivalent to the upper screened interval in the Town of Gilbert public supply Well #15. The Town of Gilbert Well #15 is located approximately 2,800 feet northwest of the Site.

2004: ADEQ conducted a preliminary investigation and placed the Site on the WQARF Registry in June. The site's Eligibility & Evaluation Score was 33 out of a possible 120.

2005: ADEQ conducted quarterly groundwater monitoring at the Site. In general, concentrations of PCE in the groundwater have been lower than concentrations previously detected at the Site. Groundwater samples and groundwater elevation data were collected from on-site monitor wells, ADEQ's off-site monitor wells and monitor wells belonging to the Town of Gilbert. Groundwater flow direction was difficult to determine based on the groundwater elevation data collected. Surface elevations of all wells were resurveyed in August and significant elevation differences were noted in the on-site and Town of Gilbert monitor wells. In September, PCE was detected for the first time in MW-104D at a concentration of 0.59 µg/l.

2006: ADEQ completed an ERA evaluation at the Site. During this ERA evaluation, ADEQ investigated the depth of groundwater contamination at the Site and installed an extraction well (EW-101) located northwest of the drywell. ADEQ determined the concentrations of PCE in the soil and soil vapor at the Site and installed several soil vapor monitor wells, SVE wells, and groundwater air sparge wells. ADEQ also collected and analyzed additional shallow soil samples to begin to define the extent of surface soil contamination indicated by previous samples collected. The results of the ERA evaluation at the Site indicated the need to move forward with the ERA. Soil and soil vapor data detected PCE above the minimum GPL and residential SRLs. The ERA evaluation report provided by ADEQ's contractor, Hydro Geo Chem, recommended treating the unsaturated zone contamination through SVE combined with air sparge to remediate groundwater. The report also recommended groundwater extraction to control off-site migration of groundwater.

ADEQ also installed Well MW-105 located 600 feet to the northeast and Well MW-106 located 1,200 feet west of the Site. Analytical results from MW-105 and MW-106 indicated the extent of the groundwater contamination plume had not been defined because PCE concentrations in these new wells were above the AWQS. In August, PCE was detected again in MW-104D. The concentration detected was 0.44 µg/l.

2007: In May, ADEQ installed three groundwater monitor wells off-site to continue to determine the extent of the plume. In August, ADEQ conducted an SVE pilot test to determine unsaturated zone properties. Based on the information gathered during the SVE pilot test, ADEQ and their contractor, Hydro Geo Chem, began designing the SVE system.

During September, ADEQ conducted an aquifer test on EW-101. Based on the data gathered during the aquifer test for the extraction well, EW-101, ADEQ and Hydro Geo Chem began designing the groundwater pump and treat system.

2008: In February, ADEQ installed three additional monitor wells off-site to continue to determine the extent of the plume. Concentrations of PCE in these wells indicated the groundwater contamination plume extends north of Guadalupe Road.

In April, ADEQ began construction of the SVE and groundwater pump and treat systems. Construction of the treatment system compound was completed in July. The Maricopa County Air Permit required to operate the SVE treatment system was received in July. Difficulties

associated with a damaged and unusable APS transformer delayed electrical power to the treatment compound. The new transformer was installed in November. Initial startup of the SVE system occurred on December 22.

ADEQ worked on finalizing the construction design for the conveyance of treated groundwater to the Salt River Project lateral south of the Site and the Town of Gilbert wastewater treatment plant to the east of the Site. The Arizona Pollutant Discharge Elimination System (AZPDES) permit, required to discharge to a water of the United States, was granted on November 18.

2009: Initial start-up of the air sparge (AS) system occurred on May 6. During the first year of operation, approximately 3,190 pounds of tetrachloroethene (PCE) and trichloroethene (TCE) were recovered. ADEQ continues to operate and maintain the SVE/AS system.

The Town of Gilbert approved ADEQ's plans to discharge treated groundwater to the water treatment plant located immediately east of the Site. Salt River Project (SRP) and ADEQ finalized the agreement for construction in the SRP right of way and to discharge to the canal south of the site. Once access is obtained, ADEQ will complete the conveyance to discharge treated groundwater to the SRP canal.

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Contaminants:

The current contaminants of concern in the groundwater at the Site include tetrachloroethene (PCE) and trichloroethene (TCE). Contaminants of concern in the soils at the Site include arsenic, chromium, copper, TPH, mercury and lead. Contaminants of concern at the Site may change as new data become available.

Public Health Impact:

No irrigation, drinking water or other production wells have been impacted by the VOC contamination from the Site. However, PCE and TCE are present in the groundwater monitor wells at or near the Site at concentrations above the AWQS.

Site Hydrogeology:

The Site is located within the eastern Salt River Valley (SRV) Sub-Basin. The eastern SRV is comprised of basin-fill deposits overlain by stream alluvium (sand and gravel). Basin-fill deposits have been subdivided into upper and lower basin-fill.

The upper basin-fill is generally composed of unconsolidated to moderately consolidated alluvial deposits, grading to finer grained deposits towards the basin interior. The upper basin-fill may be as thick as 1,000 feet in the eastern SRV. Stream alluvium has been deposited by the ancestral Salt River drainage system and consists primarily of coarse unconsolidated deposits. Additionally, finer-grained flood plain deposits may be associated with the stream alluvium.

Based on monitor wells drilled near the Site, it appears the stream alluvium is present to 270 feet bgs. Finer grained sediments of the upper basin-fill are present to a depth of at least 750 bgs. Depth to groundwater is approximately 130 feet. In the area of the Site the direction of groundwater flow is usually to the west-northwest.

Contacts:

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*In Arizona, but outside the Phoenix area, call toll-free at (800) 234-5677.

Information Repository:

Interested parties can review select Site documents at the Southeast Regional Library at 775 N. Greenfield Road in Gilbert, Arizona.

The complete official Site file can be reviewed at the ADEQ Main Office located at 1110 W. Washington Street, Phoenix. Please contact (602) 771-4380 or (800) 234-5677 to schedule an appointment with 24-hour notice to review these documents. 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.