

**PROPOSED REMEDIAL OBJECTIVES REPORT
COOPER ROAD AND COMMERCE AVENUE
WQARF REGISTRY SITE
GILBERT, ARIZONA**



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LIST OF ABBREVIATIONS & ACRONYMS

A.A.C.	Arizona Administrative Code
ADEQ	Arizona Department of Environmental Quality
ADWR	Arizona Department of Water Resources
A.R.S.	Arizona Revised Statutes
AS/SVE	Air Sparge/Soil Vapor Extraction
AWQS	Aquifer Water Quality Standard
BGS	Below Ground Surface
CAP	Central Arizona Project
COC	Chemicals of Concern
ERA	Early Response Action
FS	Feasibility Study
Ft/day	Feet Per Day
GI	General Industry
LI	Light Industrial
MCL	Maximum Contaminant Level
µg/L	Micrograms Per Liter
Mg/kg	Milligrams per Kilogram
MGD	Million Gallons Per Day
NRF	Neely Recharge Facility
PCE	Tetrachloroethene
RI	Remedial Investigation
RO	Remedial Objective
ROD	Record Of Decision
rSRLs	Residential Soil Remediation Levels
RWCD	Roosevelt Water Conservation District
SRP	Salt River Project Agricultural Improvement and Power District
TCE	Trichloroethene
TOG	Town Of Gilbert
VOC	Volatile Organic Compound
WQARF	Water Quality Assurance Revolving Fund
WRF	Water Reclamation Facilities

1.0 INTRODUCTION

The Arizona Department of Environmental Quality (ADEQ) has prepared this Proposed Remedial Objectives (ROs) report for the Cooper Road and Commerce Avenue Water Quality Assurance Revolving Fund (WQARF) Registry Site (the Site) to meet requirements established under Arizona Administrative Code (A.A.C.) R18-16-406. This RO report relies upon the land and water use study questionnaires collected in 2013 and the solicitation of proposed Remedial Objectives during the comment period on the Draft Remedial Investigation report (RI) in 2014. The land and water use questionnaires are included in Appendix I of the RI Report prepared by Hydro Geo Chem for ADEQ.

ROs are established for the current and reasonably foreseeable uses of land and waters of the state that have been or are threatened to be affected by a release of a hazardous substance. Pursuant to A.A.C. R18-16-406(D), it is specified that reasonably foreseeable uses of land are those likely to occur at the site and the reasonably foreseeable uses of water are those likely to occur within one hundred years unless site-specific information suggests a longer time period is more appropriate.

Reasonably foreseeable uses are those likely to occur, based on information provided by water providers, well owners, land owners, government agencies, and others. Not every use identified in the RI report will have a corresponding RO. Uses identified in the RI report may or may not be addressed based on information gathered during the public involvement process, limitations of WQARF, and whether the use is reasonably foreseeable.

The ROs must be stated in the following terms: (1) protecting against the loss or impairment of each use; (2) restoring, replacing, or otherwise providing for each use; (3) when action is needed to protect or provide for the use; and (4) how long action is needed to protect or provide for the use.

The ROs chosen for the site will be evaluated in the feasibility study (FS) phase of the WQARF process. The FS will evaluate specific remedial measures and strategies required to meet ROs. A remedial strategy is one or a combination of six general strategies identified in Paragraph B.4 of Arizona Revised Statutes (A.R.S.) § 49-282-06 (plume remediation, physical containment, controlled migration, source control, monitoring, and no action.) A.R.S. § 49-282-06(B)(4)(a) indicates that for remediation of soil, the selected remedial action shall be consistent with the soil remediation standards adopted pursuant to A.R.S. § 49-152. A remedial measure is a specific action taken in conjunction with remedial strategies to achieve one or more ROs (for example, well replacement, well modification, water treatment, water supply replacement, and engineering controls.)

The FS will propose at least three remedies (a reference remedy and generally two alternative remedies) capable of meeting ROs. A reference remedy is a combination of remedial strategies and measures capable of achieving ROs, and is compared with alternative remedies for purposes of selecting a proposed remedy. An alternative remedy is a combination of remedial strategies and measures different from the reference remedy; alternative remedies are compared with the reference remedy for purposes of selecting a proposed remedy. Proposed remedies will also be generally compatible with future land use specified by land owners.

Written comments on this proposed RO report will be accepted for a period of 30 days following the release. If significant public interest exists or if significant issues or information are brought to the attention of ADEQ, the comment period may be extended. The final RI report will include a responsiveness summary to written comments received from the public during the comment period. The final RO Report will be an appendix to the final RI Report.

2.0 REMEDIAL OBJECTIVES FOR LAND USE

The 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 Encinas Street, to the south by the Neely Ranch Preserve, to the east by the Neely Street and to the west by Ocotillo Drive. Through the RI process the following Contaminants of Concern (COCs) have been identified in soil, soil vapor, and groundwater at the site. The COCs in the groundwater at the site include tetrachloroethene (PCE) and trichloroethene (TCE). Contaminants of concern in the soils at the source area of the Site include PCE, arsenic and copper.

The Site incorporates a groundwater solute plume that is located in the vicinity of the former Unichem International, Inc. (Unichem) facility at 619 West Commerce Road in Gilbert. The main source of contamination at the source area property appears to be a dry well constructed on the property in 1977 in a triangular-shaped sump near the center of the concrete pavement that served as a foundation for the processing plant on site. Soil contamination at depths of approximately 70 feet below ground surface (bgs) near the area of the drywell are known to exceed the residential Soil Remediation Level (rSRLs) for PCE of 5.1 milligrams per kilogram (mg/kg) with concentrations as high as 3,900 mg/kg when last sampled in 2012.

The former Unichem facility has undergone numerous uses and processes, and disposal practices have resulted in soil impacted by PCE, other solvents, cyanide and priority pollutant metals. Groundwater beneath the Site is contaminated with PCE, TCE and arsenic above maximum contaminant levels (MCLs) or Aquifer Water Quality Standards (AWQS). Arsenic is present in soils and groundwater at the site. In the groundwater, there is no spatial pattern to arsenic concentrations that would be consistent with a release. Rather, arsenic appears to be a naturally occurring constituent that is not related to the Site.

An early response action (ERA) was initiated at the Site in 2005. The ERA for the Site included the installation and operation of an air sparge, soil vapor extraction system (AS/SVE) and a groundwater extraction system. The AS/SVE system was intended to address PCE contamination in the vadose zone and groundwater at the former Unichem facility. The groundwater extraction system was also intended to address PCE contamination in the groundwater and effect capture of the PCE solute plume in the source area.

The AS/SVE system operated from December 2008 through August 2014. The AS/SVE system has removed approximately 4,665 pounds of volatile organic compounds (VOCs). The groundwater extraction well and water treatment plant operated from August 2010 to September 2014. The plant treated a cumulative total of over 193 million gallons of groundwater through the end of September 2014. Approximately 41 pounds of VOCs were removed by the groundwater treatment system.

The Site is directly underlain by a fine-grained clayey interval to about 70 feet bgs that overlies a coarse-grained sand and gravel sequence extending to a depth of about 270 feet bgs. Depth to water at the Site is approximately 110 feet bgs. The elevations and thickness of the sand and gravel unit correspond reasonably well with the mapped distribution of the upper alluvial unit of Laney and Hahn.

In the immediate area of the Site, the Town of Gilbert (TOG) uses water from the upper alluvial unit of the aquifer for recreation use. Water for recreation use is currently withdrawn from the shallow aquifer at TOG well R-1, located approximately 4,000 feet west of the source area property.

Underlying the upper alluvial unit at the Site, the sequence of silts, clays and sands are considered to be the middle alluvial unit and provide water to several water supply wells. The middle alluvial unit of the aquifer is used for municipal supply by the TOG. Well TOG #15 produces from an interval of 570 to 950 feet bgs. TOG # 15 is located approximately 2,700 feet northwest of the source area. The deeper aquifer is also used to provide irrigation water for the Salt River Project Agricultural Improvement and Power District (SRP). TOG #15 is jointly operated by the TOG and SRP and identified by SRP as well 29E-1.0S. An additional SRP well, 29E-1.5S, is located 1,400 feet west of the source area property.

In the upper alluvial unit groundwater is migrating at rates ranging from approximately 2.7 feet per day (ft/day) to 3.7 ft/day, and averaging 3.1 ft/day based on water level data collected during year 2013. These are also the expected migration rates of a conservative (non-sorbing) solute assuming no hydrodynamic dispersion, degradation, or volatilization. Dissolved COCs are expected to have migrated in the same direction as groundwater. Groundwater flow directions over the period of observation (2002 – 2013) have ranged from generally westward to generally northwestward.

Currently, PCE in the upper alluvial unit is known to extend at least 3,800 feet to the north, approximately 3,850 feet to the northwest, and at least 3,000 feet to the west of the former Unichem facility.

The upper alluvial unit and the productive horizon in the middle alluvial unit are separated by a several hundred foot clayey layer that may serve as an aquiclude, limiting vertical migration of contaminants. However, low concentrations of PCE were detected in 2005 and 2006 in the deep monitoring well, MW-104D, indicating that some hydraulic connection exists between the upper and middle aquifers at the Site. MW-104D is located between the source area property and TOG # 15. The screened interval of MW-104D is from 580 to 610 feet bgs, within the upper portion of the productive interval of TOG #15. PCE is also detected in the recently installed deep monitor well, MW-119D, near SRP well 29E-1.5S. This SRP well is screened across both aquifers, possibly providing a direct conduit between them. Additionally, significant downward vertical gradient exists between the two aquifers suggesting the potential for vertical migration of contaminants.

In the area of the Site, land is zoned by the TOG for General Industrial (GI) uses. The portion of the site bounded to the west by North Cooper Road and to the north by West Guadalupe Road (along the Union Pacific Railroad corridor) is zoned primarily for GI and Light Industrial (LI) uses. Zoned land uses at the portion of the Site situated north of West Guadalupe Road and west of North Cooper Road are primarily Single Family Residential, with some General Commercial, Neighborhood Commercial, and Multi-Family Residential. The small section of the Site located east of North Cooper Road and south of the Western Canal is zoned for Public Facility/Institutional use, and is the location of the Neely Ranch Riparian Preserve (Figure 1).

The source area property is currently owned by K.B. East Properties, L.L.C. and is used for the storage of steel by Skyline Steel, Inc.

2.1 Summary of Current and Reasonably Foreseeable Land Use

Based on the current zoning maps provided by the TOG, the Site is zoned as residential, commercial and light industrial. Based on the responses in the land and water use study questionnaire sent to the TOG, there are no immediate plans to change the land use or zoning for the areas within and adjacent to the Site.

2.2 Soil Remedial Objective

Land in the area of the Site is currently, and will for the foreseeable future, be zoned for residential, commercial and light industrial uses. Therefore, the ROs for land use at the site are:

To restore soil conditions to the remediation standards for intended end use specified in A.A.C. R18-7-203 (specifically background remediation standards prescribed in R18-7-204, predetermined remediation standards prescribed in R18-7-205, or site specific remediation standards prescribed in R18-7-206) that are applicable to the hazardous substances identified. This action is needed for the present time and for as long as the level of contamination in the soil threatens its intended end use.

3.0 REMEDIAL OBJECTIVES FOR GROUNDWATER USE

The land and water use portion of the RI report is an inclusive summary of information gathered from the Arizona Department of Water Resources (ADWR), water providers, municipalities, and land owners.

3.1 Summary of Current and Reasonably Foreseeable Groundwater Use

The TOG's water resources portfolio consists of surface supplies from SRP, the Roosevelt Water Conservation District (RWCD), and the Central Arizona Project (CAP), as well as groundwater from 18 production wells. Additionally, the TOG's reclaimed water program has reduced groundwater pumping in recent years. Surface water supplies are vulnerable to drought conditions, which are predicted to increase in prevalence in the southwest into the future.

TOG potable water use totaled 47,595 acre-feet in 2011, serving 212,084 users. Residential demand accounts for 70% of this water, with the remaining 30% utilized for non-residential uses. The TOG operates two water treatment plants that treat up to 57 million gallons per day (MGD) of SRP, RWCD, and CAP supplied surface water to potable quality. This capacity is slated to be expanded to 59 MGD when required by growth. The 18 potable water supply groundwater wells that yield up to 41.6 MGD of potable water. Seven additional wells are planned, bringing the total potable groundwater production capacity of the TOG to 55 MGD at build-out.

The TOG operates seven non-exempt wells within and near the Site. One TOG drinking water supply well, TOG #15 (ADWR 55-542431), is located approximately 2,700 feet down gradient from the Unichem facility at the southwest corner of West Guadalupe Road and North Cooper Road, within the Site boundaries, and is threatened by the groundwater contamination at the Site. TOG #15, which pumped 134 acre-feet of water in 2011, is jointly operated by SRP and identified by SRP as well 29E-1.0S (Figure 1).

A different non-exempt production well (ADWR 55-541861) was formerly designated as TOG #15, but has not been pumped in roughly a decade and does not currently have a pump installed. However, the former TOG #15 has not been capped or abandoned, and is located approximately 4,000 feet northwest (down gradient) from the Unichem facility. Therefore, the former TOG #15 is threatened by groundwater contamination at the Site although it is not currently in use and there are no plans to do so.

An additional non-exempt TOG drinking water supply well, TOG #14 (ADWR 55-534889), is located roughly 2,600 feet southeast of the Site, along the Union Pacific Railroad corridor between North Neely Street and North Gilbert Road. TOG#14 is up gradient from groundwater contamination at the Site, and pumped 51.3 acre-feet of water in 2011.

The TOG's Neely Recharge Facility (NRF), located immediately south of the former Unichem facility, recharges water from the Neely WRF via 11 recharge basins. The discharges are regulated under Aquifer Protection Permit number P-102716 issued by ADEQ's Water Quality Division. The TOG has partnered with ADEQ in limiting discharge to the NRF recharge basins in order to

minimize the impact of groundwater mounding resulting from artificial recharge on the ongoing remediation of contaminants associated with the Site.

The TOG also operates several non-exempt wells in the Site vicinity that are used for recovery of recharged water for irrigation and recreational uses and groundwater monitoring. These are R-1 (ADWR 55-595204), located about 4,000 feet west of the former Unichem facility and currently outside the Site boundary, G-7 and G-8 (ADWR 55-524081 and 55-524082, respectively), located just southeast of the former Unichem facility outside the Site boundary, and G-10 (ADWR 55-539954), located outside the Site boundary just south of the former Unichem facility.

Non-exempt well R-1 pumped 179.6 acre-feet of water in 2011 and is used to supply water to local lakes. Well R-1 is located down gradient from the former Unichem facility, while G-10 is cross, down gradient and G-7 and G-8 are up gradient. PCE was detected at a concentration of 1.1 micrograms per liter ($\mu\text{g/L}$) in TOG well R-1 when last sampled in April 2014. The AWQS for PCE is 5.0 $\mu\text{g/L}$. Groundwater contamination at the Site may pose a risk at R-1, as the western plume boundary has not been well-delineated. Due to groundwater contamination at the Site, the TOG limits the pumping of groundwater recovery wells G-7, G-8 and G-10 located at the NRF. In the past, and depending on the groundwater flow direction, well G-10 has been impacted from the Site.

The TOG applied in late 2013 to ADWR and ADEQ for permission to incrementally increase recharge flows at the NRF so as to increase accrual of groundwater storage credits, and hopes to use wells G-7, G-8, and G-10 for recovery of recharged water once groundwater quality in the area improves.

Wells G-7, G-8, and G-10 are also utilized for groundwater monitoring purposes, along with designated NRF monitor well G-9 located within the Site (Figure 1).

SRP operates various power transmission and distribution lines, irrigation turnout structures, lateral canals, and three non-exempt groundwater supply wells used for irrigation, recreational, and municipal supply in the vicinity of the Site. 29E-1.0S (TOG #15; ADWR 55-542431), 29E-1.5S (ADWR 55-617105), and 29E-2.0S (ADWR 55-617104).

SRP 29E-1.5S is located approximately 1,400 feet west, down gradient of the former Unichem facility at the southeast corner of North Cooper Road and the Western Canal. PCE was first detected in this well at a concentration of 1.3 $\mu\text{g/L}$ in 2007; a sample collected in 2009 detected PCE at a concentration 12.4 $\mu\text{g/L}$. As part of a May 25, 2010 agreement between ADEQ and SRP regarding the discharge of treated groundwater from the Site to SRP Lateral 9.5, SRP agreed to minimize pumping of SRP well 29E-1.5S except under drought conditions and to meet short-term operational requirements. SRP well 29E-1.5S was completed in 1949 to a depth of 596 feet bgs, with a screened interval straddling the upper and middle alluvial aquifers from 210 to 580 feet bgs. SRP well 29E-1.5S was permitted as a recovery well in 1990 and allotted 150 acre-feet per year in pumpage to maintain artificial lakes in the area. Total pumpage from SRP well 29E-1.5S was 1.4 acre-feet in 2011.

SRP well 29E-2.0S, at the northeast corner of West Elliot Road and North Cooper Road, is located up gradient of the former Unichem facility, outside the Site boundaries, and has not been impacted

by groundwater contamination at the Site. SRP well 29E-2.0S was completed in 1940 to a total depth of 400 feet bgs with a screened interval straddling the upper and middle alluvial aquifers from 124 to 385 feet bgs. Total pumpage from SRP well 29E-2.0S was 24.9 acre-feet in 2009.

Based on the responses in the land and water use study questionnaire sent to SRP, there are no current plans for further development of infrastructure or groundwater resources in the vicinity of the Site, as the area is largely built-out. Water quality concerns at the Site are of interest to SRP, as groundwater plays a key role in making up drought-induced shortages in their service area.

The only other non-exempt well located within 1.0 mile of the Site is EW-101, the extraction well operated by ADEQ as part of ERA activities.

The Maricopa Association of Governments owns three exempt wells that are used as monitoring wells, and designated by the TOG as G-1, G-2, and G-5. All three of these wells are completed in the upper alluvial unit. Wells G-1 and G-2 are located south of the former Unichem facility outside the Site boundary, and are up gradient of contamination at the Site. Therefore, groundwater contamination at the Site would not be expected to threaten G-1 and G-2 were they to be used as exempt production wells. Well G-5 is located one mile to the northwest of the former Unichem facility near the corner of North Nevada Street and West Encinas Street, down gradient of contamination at the Site. The concentration of PCE was not detected in an October 2013 sample from ADEQ monitoring well MW-113 located approximately 0.3 miles south east of G-5. PCE has been detected at concentrations below the AWQS for PCE of 5 µg/L at MW-113 since it was installed in 2011, and groundwater contamination from the Site could threaten G-5 were it to be used as an exempt production well rather than a monitoring well (Figure 1).

There are four privately-owned, exempt wells within one mile of the Site (Figure 1). No pumping data are available for these wells, which are listed as domestic water production wells. The E.W. Cooley well (ADWR 55-636808) has a listed location immediately west of TOG #15, down gradient of contamination at the Site. The Eldon Cooley well (ADWR 55-636811) is listed as being approximately 4,700 feet northwest (down gradient) of the former Unichem facility. Notably, ADWR was unable to locate both of these wells (55-636808 and 55-636811) during a 2005 inventory of wells in the area, and they may have been destroyed without being officially abandoned. The Hunter Ditch Lining well (ADWR 55-635924) is located approximately 1,200 feet northwest (down gradient) of the former Unichem facility and is believed to be damaged and unusable. If these well exist or are usable, due to their down gradient location, these three wells may be threatened by groundwater contamination at the Site.

The L.M. Pace well (ADWR 55-634676) has a listed location approximately 2,400 feet southwest (cross gradient) of the former Unichem facility, and is therefore likely not at risk from contamination at the Site. ADWR was also unable to locate the L.M. Pace well during its 2005 inventory of wells in the area, and this well may have been destroyed without being officially abandoned (Figure 1).

3.2 Groundwater Remedial Objective

Current groundwater use in the area of the site is for municipal, irrigation and recreational uses. The RO for groundwater at the site is:

To protect, restore, replace or otherwise provide a water supply for potable or non-potable use by currently impacted, municipal, domestic, agricultural/irrigation and recreational well owners within or near the Cooper Road and Commerce Avenue WQARF site if the current and reasonably foreseeable future uses are impaired or lost due to contamination from the Site. Remedial actions will be in place for as long as need for the water exists, the resource remains available and the contamination associated with the Cooper Road and Commerce Avenue WQARF site prohibits or limits the use of groundwater for its intended end use. Remedial actions to meet ROs will be implemented upon issuance of the ROD. If there is an imminent risk to human health or the environment, then an ERA may be initiated prior to implementation of the ROD.

4.0 REMEDIAL OBJECTIVES FOR SURFACE WATER USE

The land and water use evaluation section of the RI report identified no uses of surface water in the area of the site. Therefore there are no remedial objectives required for surface water.

Figure 1

