



**FINAL PROPOSED REMEDIAL  
ACTION PLAN FOR THE  
WEST CENTRAL PHOENIX  
WEST GRAND AVENUE WQARF SITE  
PHOENIX, ARIZONA**

**Prepared by  
ADEQ and URS Corporation  
February 2014**



EXPIRES 3/31/2014



TABLE OF CONTENTS

1.0 INTRODUCTION..... 1-1
1.1 PURPOSE OF DOCUMENT ..... 1-1
1.2 WCP WGA SITE NAME AND LOCATION ..... 1-2
2.0 WCP WGA SITE BACKGROUND..... 2-1
2.1 CONTAMINATED MEDIA ..... 2-1
2.2 HISTORY OF WASTE GENERATION AND DISPOSAL..... 2-1
2.3 HISTORY OF WCP WGA SITE INVESTIGATIONS AND EARLY RESPONSE ACTIONS ..... 2-2
2.4 HISTORY OF ENFORCEMENT ACTIVITIES..... 2-5
2.5 PREVIOUS PUBLIC PARTICIPATION..... 2-5
3.0 WCP WGA SITE CHARACTERISTICS ..... 3-1
3.1 GEOLOGIC AND HYDROGEOLOGIC SETTINGS ..... 3-1
3.1.1 Geologic Setting..... 3-1
3.1.2 Hydrogeologic Setting ..... 3-1
3.2 NATURE AND EXTENT OF CONTAMINATION ..... 3-3
3.2.1 Source of Release..... 3-3
3.2.2 Soil ..... 3-4
3.2.3 Groundwater ..... 3-5
4.0 SCOPE AND ROLE OF REMEDIAL ACTIONS ..... 4-1
4.1 OVERALL CLEANUP GOAL ..... 4-1
4.2 SCOPE OF GROUNDWATER PLUME REMEDIAL ACTIONS ..... 4-1
5.0 REMEDIAL OBJECTIVES ..... 5-1
5.1 REMEDIAL OBJECTIVES FOR LAND USE..... 5-1
5.2 REMEDIAL OBJECTIVES FOR GROUNDWATER USE..... 5-1
5.3 BASIS FOR SELECTING CLEANUP LEVELS ..... 5-3
6.0 SUMMARY OF REMEDIAL ALTERNATIVES ..... 6-1
6.1 REFERENCE REMEDY ..... 6-1
6.2 MORE AGGRESSIVE ALTERNATIVE REMEDY ..... 6-2
6.3 LESS AGGRESSIVE ALTERNATIVE REMEDY..... 6-3
7.0 EVALUATION OF ALTERNATIVES ..... 7-1
7.1 PRACTICABILITY ..... 7-1
7.2 COST ..... 7-2
7.3 RISK ..... 7-2
7.4 BENEFIT ..... 7-2
8.0 PROPOSED REMEDY ..... 8-1
8.1 PROPOSED REMEDY AND RATIONALE FOR SELECTION ..... 8-1
8.2 ACHIEVEMENT OF REMEDIAL OBJECTIVES ..... 8-1
8.3 CONSISTENCY WITH WATER MANAGEMENT PLANS..... 8-1



WEST GRAND AVENUE WQARF SITE

8.4 CONSISTENCY WITH GENERAL LAND USE ..... 8-2

8.5 LEAD AGENCY STATEMENT FOR REMEDY SELECTION ..... 8-2

**9.0 COMMUNITY PARTICIPATION..... 9-1**

9.1 PUBLIC COMMENT PERIOD OF PRAP ..... 9-1

9.2 PUBLIC MEETINGS ..... 9-1

9.3 ADMINISTRATIVE RECORD ..... 9-1

9.4 OTHER CONTACT INFORMATION ..... 9-1

**10.0 REFERENCES..... 10-1**

**LIST OF FIGURES**

- 1 Boundaries of WCP WGA Site
- 2 Well Location Map, West Grand Avenue and West Osborn Complex WQARF Site, Phoenix, AZ



LIST OF ACRONYMS	
A.A.C.	Arizona Administrative Code
ADEQ	Arizona Department of Environmental Quality
ADHS	Arizona Department of Health Services
ADWR	Arizona Department of Water Resources
A.R.S.	Arizona Revised Statute
AWQS	Aquifer Water Quality Standards
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CAB	community advisory board
COC	chemical of concern
COP	City of Phoenix
1,1-DCE	1,1-dichloroethene
EPA	U.S. Environmental Protection Agency
ERA	Early Response Action
FS	Feasibility Study
LAU	Lower Alluvial Unit
MAU	Middle Alluvial Unit
MCL	Maximum Contaminant Level
mg/Kg	Milligrams per kilogram
NFA	No Further Action
PCE	tetrachloroethene
PRAP	Proposed Remedial Action Plan
RI	Remedial Investigation
RO	Remedial Objective
SRL	Soil Remediation Level
SRP	Salt River Project
SRV	Salt River Valley
SVE	soil vapor extraction
TCA	1,1,1-trichloroethane
TCE	trichloroethene
UAU	Upper Alluvial Unit
µg/L	micrograms per liter
URS	URS Corporation
UST	underground storage tank
VOC	volatile organic compound
WCP	West Central Phoenix
WGA	West Grand Avenue
WQARF	Water Quality Assurance Revolving Fund



## 1.0 INTRODUCTION

### 1.1 PURPOSE OF DOCUMENT

URS Corporation (URS) has been retained by the Arizona Department of Environmental Quality (ADEQ), to prepare this proposed remedial action plan (PRAP) for the West Central Phoenix (WCP) West Grand Avenue (WGA) Water Quality Assurance Revolving Fund (WQARF) Site (hereinafter referred to as the WCP WGA Site), located in Phoenix, Arizona (see Figure 1). There is one plume associated with the WCP WGA Site, the former and current boundaries of which are shown in Figure 1. ADEQ is required under Arizona Revised Statute (A.R.S.) §49-287.04 to issue a PRAP for the proposed remedy of the WCP WGA Site plume to the public for review and comment. This PRAP was prepared in accordance with Arizona Administrative Code (A.A.C.) R18-16-408 and summarizes information contained in the following documents:

- Draft Remedial Investigation Report, West Central Phoenix, West Grand Avenue Site, Phoenix, Arizona (ADEQ, 2004)
- Final Feasibility Study for West Central Phoenix, West Grand Avenue WQARF Site (URS, 2013).

The information contained in the PRAP is drawn from and, in many cases, quotes directly from the above-referenced remedial investigation (RI) and feasibility study (FS) reports without attribution other than that noted here.

The purpose of the PRAP is to inform the public on the proposed remedy selected from the alternatives evaluation in the FS to address the WCP WGA Site plume and satisfy the cleanup goals that include site specific remedial objectives (ROs) (ADEQ, 2005). The PRAP is part of the final remedy selection process under WQARF where public input is solicited on all alternatives and on the rationale for proposing the preferred remedy. New information that ADEQ receives during the public comment period could result in the selection of a final remedy that differs from the proposed remedy. Therefore the public is encouraged to review and comment on all the alternatives presented in this PRAP. Information on public participation activities associated with this PRAP is provided in Section 9.0.



## 1.2 WCP WGA SITE NAME AND LOCATION

The WCP WGA Site is located in Phoenix, Arizona, and consists of the groundwater plume associated with a former underground storage tank (UST) located at the Layke Incorporated (Layke) facility. The WCP WGA Site was originally designated as part of the WCP WQARF Site in 1987. Data obtained indicated three primary areas of volatile organic compound (VOC) contamination, which were known as the “Main Plume Area,” the “WCP North Plume Site,” and the “Southeast Area.” Subsequent investigations indicated that the “Main Plume Area” consisted of several separate plumes of contamination, including the WCP WGA Site. ADEQ established the WQARF Registry, replacing the Priority List, in 1997. In 1998, the WCP WQARF Site was divided into five WQARF Registry Sites, one of which is the current WCP WGA Site.

The WCP WGA Site study area is bounded by Osborn Road to the north, 31<sup>st</sup> Avenue to the east, Thomas Road to the south, and 35<sup>th</sup> Drive to the west in Phoenix, Arizona (ADEQ, 2012). The WCP WGA Site plume boundaries reflect the estimated historic extent of the contaminant plume. Figure 1 presents the WCP WGA Site boundary originally established in 1998, as well as the currently designated WQARF boundary, as redefined in June 2003.



## 2.0 WCP WGA SITE BACKGROUND

### 2.1 CONTAMINATED MEDIA

The contaminated media associated with this PRAP is groundwater, specifically the WCP WGA Site plume. The primary chemical of concern (COC) associated with the WCP WGA Site plume is trichloroethene (TCE). An Early Response Action (ERA) completed at the WCP WGA Site has addressed contamination in other media (i.e., vadose zone soils).

### 2.2 HISTORY OF WASTE GENERATION AND DISPOSAL

The complete history of development at the WCP WGA Site is summarized in the *Draft Remedial Investigation Report, West Central Phoenix, West Grand Avenue Site, Phoenix, Arizona* (ADEQ, 2004) and the *Final Feasibility Study for West Central Phoenix, West Grand Avenue WQARF Site* (URS, 2013) reports. The following provides a brief history of chemical usage, waste generation or disposal activities conducted at the WCP WGA Site.

The Layke facility is located at 3330 West Osborn Road in Phoenix, Arizona. The area surrounding the facility is predominantly comprised of mixed industrial and commercial properties with a low-density residential area located east of the Layke facility.

Layke began operations at the facility in 1967. The operations included the manufacturing of metal parts that utilized various chemical cutting oils, water-soluble cutting fluids, and solvents. The solvents used included tetrachloroethene (PCE) in 1982; TCE from 1969 to approximately 1985; and 1,1,1-trichloroethane (TCA) from 1983 to 1988. Reportedly, solvents and cutting oils were stored in 55-gallon drums at the facility and the water-soluble oils were stored in a UST prior to being shipped off-site for disposal.

Layke used the UST for waste chemical storage from 1967 to 1989. During the years the UST was used, it appears that the UST was periodically overfilled and leaked between the lid and main structure. The amount of waste lost to the environment is unknown. Although the UST was found to be intact (at the time of removal), evidence of leakage was found around the entrance to the tank and tank cover.



## 2.3 HISTORY OF WCP WGA SITE INVESTIGATIONS AND EARLY RESPONSE ACTIONS

The detailed history of site investigations and ERAs completed at the WCP WGA Site was summarized in the RI (ADEQ, 2004) and the FS (URS, 2013) reports. The following provides brief summaries of the main events and investigative/ERA milestones for the WCP WGA Site:

- **1982:** The City of Phoenix (COP) detected TCE in four municipal public supply wells, including COP wells #70, #71, #151, and #152. Since the TCE concentrations exceeded the U.S. Environmental Protection Agency (EPA) Maximum Contaminant Level (MCL) of 5 micrograms per liter ( $\mu\text{g/L}$ ) in COP wells #70 and #71, these two wells were immediately shut down.
- **1983 – 1989:** The Arizona Department of Health Services (ADHS), Salt River Project (SRP), and the COP confirmed the presence of VOCs in the groundwater with sampling in 1983, 1985, and 1986. COP wells #151 and #152 were taken off-line on March 7, 1989. ADHS also identified dissolved-phase VOCs in the West Osborn Complex Irrigation Well (Pincus Well).
- **1987:** The WCP area was designated a WQARF priority list site.
- **1989 – 1991:** Following a preliminary assessment and site investigation at the Layke facility indicating detectable concentrations of TCE in soil vapor in the vicinity of the UST, ADEQ referred the site for further investigation
- **1990:** In 1990, the UST was removed from the Layke facility and several soil investigations were conducted including sampling of the UST contents (sludge) and soil sampling within the UST basin. In addition, subsurface soil samples were collected in the chemical storage area. Analytical results indicated the presence of TCE, PCE and low levels of benzene, toluene, ethylbenzene and xylenes (BTEX) in the soil samples collected. Concentrations of TCE in the soil samples ranged from 0.01 milligram per kilogram (mg/Kg) to 230 mg/Kg. The sludge sample was found to contain TCE at 1,400 mg/Kg, 1,1-dichloroethene (1,1-DCE) at 2 mg/Kg, PCE at 24 mg/Kg and low levels of BTEX.
- **1991:** In 1991, seven soil borings were advanced to depths ranging from 10 to 90 feet below ground surface (bgs) in the area of the former UST basin. Three soil borings were converted to soil vapor extraction (SVE) wells to depths of 60, 60 and 48 feet bgs, respectively, and later used during an ERA utilizing SVE. Based on the results of the 1991 investigation, it was concluded that the majority of VOC contamination was



detected beneath the former UST and extended to a depth of approximately 30 feet bgs. In addition, low concentrations of VOCs were detected in a silty clay unit located at approximately 55 to 65 feet bgs.

- **1992 – 1994:** As part of a groundwater investigation within the WCP study area conducted between 1992 and 1994, monitoring well WCP-4 was installed within the Layke facility and an upgradient monitoring well (WCP-8) was installed north of the Grand Canal (see Figure 2). WCP-4 was installed to determine the vertical extent of the VOC soil contamination in the area of the former UST and to evaluate whether groundwater had been impacted. Soil samples collected during well installation indicated TCE at a concentration of 49 mg/Kg at a depth of 19 feet bgs and detections of TCE at depths of 60.5 to 94.5 feet bgs with a maximum concentration of 0.090 mg/Kg. From 1992 to 1994, analytical results of groundwater samples collected from WCP-4 indicated TCE concentrations ranging from 290 µg/L to 420 µg/L. During the same time frame, no TCE, above the laboratory limit of 0.5 µg/L was detected in monitoring well WCP-8.
- **1995 - 1996:** In 1995, two shallow groundwater monitoring wells (WCP-10 and WCP-11) were installed. WCP-10 is located downgradient (to the south) and WCP-11 is located crossgradient (to the west) of the Layke facility. After the installations were completed, these monitoring wells were sampled twice and monitoring well WCP-4 was sampled once. Analytical results indicated the presence of TCE in WCP-4 at 140 µg/L and in WCP-10 at 37-45 µg/L. No TCE, above the laboratory limit of 0.5 µg/L was detected in the samples collected from WCP-11. In 1996, annual groundwater monitoring was conducted throughout the WCP area. This monitoring event included the sampling of wells WCP-4, WCP-8, WCP-10 and WCP-11. No TCE was detected in WCP-8 and WCP-11; TCE was detected in WCP-4 and WCP-10 at 190 µg/L and 33 µg/L, respectively.
- **1995 - 1998:** An ERA consisting of an SVE system was implemented by Layke at its facility from March 1995 until 1998. Installation of the SVE system was conducted from March 1 through May 26, 1995 and the SVE system was tested on March 29, 1995. Monitoring of the SVE system included collecting vapor samples of the system exhaust and screening the system exhaust vapors with a photoionization detector. ADEQ raised several performance issues regarding the operation and sampling of the SVE system including the validity of the sampling and analysis documentation. Therefore, it was difficult to accurately estimate the actual mass of VOCs removed from the soil. Consequently, although Layke's contractor estimated approximately 100 pounds (lbs) of



TCE were extracted during the first 6 months of operation of the treatment system, ADEQ's contractor estimated that 250 to 300 lbs of TCE were extracted during that same time period. In November 1997, TCE removal had decreased to an estimated rate of less than 0.007 lbs/day (ADEQ, 2004). The RI Report states that, in 1998, Layke shut down the SVE system due to financial reasons and due to the fact that VOC concentrations in the treatment system exhaust were no longer detectable. A rebound test was planned, but was never performed.

- **1999:** The Grand Canal located to the north of the Layke facility was lined in January 1999 subsequently resulting in decreasing groundwater elevations.
- **2001:** Groundwater samples were collected from WCP-4 and WCP-10 in March 2001. Analytical results of groundwater samples collected from WCP-4 indicated concentrations of TCE were below the laboratory method detection limit. TCE was detected in well WCP-10 at a concentration of 8 µg/L. Well WCP-11 was dry at the time of the sampling event.
- **2001 – 2002:** Between 2001 and 2002, ADEQ conducted an investigation to evaluate the effectiveness of the SVE system in removing VOCs from soil. Soil and soil vapor samples were collected from five borings in the vicinity of the UST and from four borings in the vicinity of the chemical storage/handling area. No VOCs were detected above the laboratory limit in the soil samples collected. Low levels of VOCs were detected in the soil vapor samples collected. Within the area of the former UST basin, TCE was detected in soil vapor at 1.2 µg/L to 6.1 µg/L and no 1,1-DCE or PCE was detected. Within the chemical storage/handling area no TCE or PCE was detected above the laboratory reporting limits in soil vapor; however, 1,1-DCE was detected at 1.1 µg/L to 1.8 µg/L. At the completion depth of the nine soil borings (approximately 136 feet bgs), Hydropunch® samplers were attached and groundwater was collected via dedicated disposable bailers. No VOCs were detected above the laboratory reporting limit in the groundwater samples collected. The soil data indicated that the contamination had been effectively remediated by the SVE system. Based on these data, ADEQ granted a No Further Action request in December 2002, pursuant to Arizona Revised Statutes (A.R.S.) §49-287.01.
- **2008:** Monitoring well WCP-235 was installed in May 2008 and is screened in the interval of 128 to 173 feet bgs (Locus, 2008). This well is located 23.5 feet east of WCP-10 (see Figure 1), which is screened from 86 to 126 feet bgs and is currently dry. At the time of installation of WCP-235, according to Arizona Department of Water Resources



(ADWR) imaged records, water was encountered at about 138 feet bgs. A groundwater sample collected following well installation in 2008 contained TCE at a concentration of 2.1 µg/L (Locus, 2008).

A map depicting groundwater monitoring well locations for the WCP WGA Site and for the West Osborn Complex WQARF site is included as Figure 2.

## 2.4 HISTORY OF ENFORCEMENT ACTIVITIES

**1987:** The WCP site, which included the WCP WGA Site at that time, was designated by ADEQ as a WQARF Priority List site.

**1998:** The WCP WGA Site was placed on the WQARF Registry by ADEQ in April 1998 with a score of 17 out of a possible 120. The WCP WGA Site score was re-evaluated in 2000 with a revised score of 22.

## 2.5 PREVIOUS PUBLIC PARTICIPATION

A WCP Community Advisory Board (CAB) was formed that has previously met on a regular basis to discuss issues and status of investigation and clean activities conducted at the WCP Sites. These meetings are open to the public and the last meeting was held on October 22, 2009. Details of the CAB meeting agendas and minutes can be viewed on the ADEQ Web site at <http://www.azdeq.gov/environ/waste/sps/reg.html>. A community involvement plan was also developed for the WCP Sites that was last updated in 2009. The following provides specific public participation activities that have been completed for the WCP WGA Site. Future public participation activities associated with this PRAP are provided in Section 9.0:

- **February 2004:** The RI Report was issued for public comment to meet the requirements under A.R.S. § 49-287.03 and A.A.C. R18-16-406. No comments were received during the 30-day comment period. Since no comments were received on the Draft RI report, the report was accepted as the Final RI report for the WCP WGA Site.
- **November 2004:** A WCP CAB meeting was conducted in November, pursuant to A.A.C. R18-16-406(I)(1), to discuss the RI Report, as well to obtain input on ROs for the WCP WGA Site.



*WEST GRAND AVENUE WQARF SITE*

- **October 2005:** ADEQ issued the Proposed RO Report for public comment to meet the requirements established under A.A.C. R18-16-406. No comments were received during the 30-day comment period.
- **2013:** The ADEQ issued the Feasibility Study Work Plan for public comment to meet the requirements of under A.A.C. R18-16-407. The ADEQ received one comment letter and believes the comments in the letter were addressed in the FS Report, which was issued in 2013.



## 3.0 WCP WGA SITE CHARACTERISTICS

### 3.1 GEOLOGIC AND HYDROGEOLOGIC SETTINGS

This section presents a summary of the geological and hydrogeologic setting of the WCP WGA Site.

#### 3.1.1 Geologic Setting

The WCP WGA Site is located within the West Salt River Valley (SRV), which is an alluvial basin characteristic of Basin and Range physiography. The SRV consists of thick basin fill deposits of unconsolidated to semi-consolidated late Tertiary to Quaternary-Age sediments overlying bedrock. The thickness of the basin-fill deposits varies from less than 100 feet near the margins of the basin to more than 10,000 feet in the central areas (Corkhill et al., 1993). The regional aquifer is comprised of basin-fill deposits consisting of conglomerate, gravel, sand, silt, clay, and evaporites. The deposits have been divided into hydrogeologic units as discussed in Section 3.1.2. Fault-blocked mountain ranges trend northwest to southeast in the SRV, characteristic of the Basin and Range physiographic province. The SRV floor includes Precambrian to middle Tertiary-age crystalline and middle Tertiary- to Quaternary-age extrusive rocks (Brown and Pool, 1989). Although not considered a regional scale aquifer, the crystalline units may transmit small amounts of water where fracturing has occurred (Corkhill et al., 1993).

The stratification of rock layers below the WCP WGA Site and in the surrounding area consists of heterogeneous alluvial/fluvial valley-fill deposits consistent with the regional geology. Coarse- and fine-grained materials alternate in the stratigraphic sequences. Site investigations within the area of the WCP WGA Site have found several fine-grained sequences consisting of silt, silt with sand, sandy silt, lean clay, and lean clay with sand. Interspersed with the fine-grained sequences were course-grained zones of silty-sand, well-graded sand, well-graded sand with silt, poorly-graded sand, clayey sand, and well-graded gravel. Between 75 and 120 feet bgs, dense calcified caliche zones were observed (ADEQ, 2004).

#### 3.1.2 Hydrogeologic Setting

The SRV includes two distinct but interconnected alluvial groundwater basins, the West SRV and the East SRV. The WCP WGA Site is located within the West SRV. Three hydrogeologic



units have been defined by the United States Bureau of Reclamation, the United States Geological Survey, and the ADWR.

In descending stratigraphic order, the three units include the Upper Alluvial Unit (UAU), the Middle Alluvial Unit (MAU), and the Lower Alluvial Unit (LAU). The UAU is reported to be between 300 and 400 feet thick in the West SRV and was once the primary source of groundwater (Corkhill et al., 1993). However, groundwater withdrawal has resulted in dewatering of the unit. The MAU is estimated to begin at 300 feet to 400 feet bgs and is approximately 650 feet thick in the West SRV. Corkhill stated that the MAU is the primary source of groundwater in the SRV and speculated that the recoverable groundwater in the unit originated from interbedded coarse layers (Corkhill et al., 1993). The LAU is estimated to be found at approximately 1,000 feet bgs in the West SRV and may be up to 1,600 feet thick (Corkhill et al., 1993).

Groundwater pumping significantly influences regional groundwater flow in the West SRV. The RI reports that historical water level elevation contour maps, developed from data collected since 1913, depict a west to southwesterly flow direction having a gradient of approximately 0.002 feet per foot (ADEQ, 2004). Major sources of groundwater recharge in the SRV include infiltration in the Salt River, seepage losses from irrigation canals, and infiltration of excess irrigation. A major source of artificial recharge to the UAU in the WCP area was the Grand Canal, an irrigation canal that transports water across the SRV. Surface water from the Salt and Verde Rivers and groundwater pumped by the Salt River Project (SRP) supply the Grand Canal. The Grand Canal's influence on recharge of the UAU has been reduced since many areas of the canal have been lined in recent years.

The followed excerpt has been excerpted from the ADEQ Site Narrative (ADEQ, 2012):

“Due principally to the ongoing drought, [groundwater elevation] has declined considerably in the past several years. In 1992, the depth to groundwater was approximately 98 feet bgs, and by April 2002, it was approximately 124 feet bgs measured in monitor Well WCP-10. Groundwater levels in Well WCP-10 decreased below the well construction depth of 130 feet bgs before September 2002. As of December 2001 groundwater flowed to the south-southwest beneath the [WCP WGA] Site at a gradient of approximately 0.003.



The Grand Canal is located along the northern edge of the [WCP WGA] Site. The Grand Canal is generally lined on the bottom and both sides in the vicinity of the [WCP WGA] Site. However, some recharge to the aquifer occurs due to infiltration from the canal.”

An irrigation well owned by SRP is located approximately 900 feet east of the WCP WGA Site and according to the Remedial Investigation report “groundwater generally flows to the south-southwest within the WCP WGA Site when the SRP does not operate the irrigation well” (ADEQ, 2004). As part of an agreement with ADEQ, the SRP did not operate this irrigation well from April 1999 until 2004.

### 3.2 NATURE AND EXTENT OF CONTAMINATION

The following sections summarize information pertaining to the source of the contamination, contaminants in soil, and contaminants in groundwater.

#### 3.2.1 Source of Release

The Layke facility, located at 3330 West Osborn Road in Phoenix, Arizona, has been identified as the source of groundwater contamination in the WCP WGA Site. Historical records and information obtained from Layke indicate that Layke began operations at the facility in 1967. The operations included the manufacturing of various metal parts. These manufacturing processes required Layke to use various chemical cutting oils, water-soluble cutting fluids, and solvents such as PCE, TCE, and TCA. TCE was the primary solvent used for parts cleaning/degreasing in a vapor degreaser that had been used at the facility from 1969 to approximately 1985. PCE was reportedly used in 1982 only. TCA was used from 1983 to 1988. Reportedly, solvents and cutting oils were stored in 55-gallon drums in the waste storage area. Water-soluble oils were stored in an UST. Various subcontractors for disposal or recycling then transported waste chemicals off-site. The UST was removed in October 1990.

Field investigation activities for the WCP WGA Site remedial investigation were conducted between 1989 and 2002. The field activities included soil and soil-gas sampling, groundwater monitoring well installations, groundwater monitoring well sampling, and Hydropunch<sup>®</sup> sampling. The distribution of contaminant concentrations in soil-gas, soil, and groundwater during the WCP WGA Site remedial investigation indicated that the source of soil and groundwater contamination in the WCP WGA Site was the former UST located at the Layke



facility. When the UST was removed in October 1990, it appeared structurally intact. However, evidence of leakage existed around the entrance to the tank and the tank cover, leading to the conclusion that the UST had overflowed at various times.

Several contaminants have been detected in soil and groundwater samples collected during field investigations at the WCP WGA Site including PCE, TCE, and 1,1-DCE. These compounds have been detected in soil samples collected on the Layke facility, and/or in groundwater samples collected from wells in the WCP WGA Site. PCE and TCE are considered the precursor degreasing solvents released into the environment with the presence of 1,1-DCE most likely due to degradation of a TCA release.

The PCE and TCE contamination found in the soil beneath the Layke facility exceeded Soil Remediation Levels (SRLs) and Groundwater Protection Levels. However, TCE is the only contaminant found at levels above the Arizona Aquifer Water Quality Standard (AWQS; A.A.C. R18-11-400) in the groundwater at the WCP WGA Site. PCE was not detected in groundwater samples collected from the WCP WGA Site groundwater monitoring wells. The lateral extent of TCE contamination in the WCP WGA Site has been defined to determine the appropriate cleanup actions needed.

### 3.2.2 Soil

Contaminants in soils beneath the Layke facility have included TCE from approximately 3 feet to 95 feet bgs in the area underlying the former UST basin and associated piping. In addition, PCE was found in the same area approximately 3 feet to 20 feet bgs. Layke implemented an ERA to remediate the PCE and TCE contamination in soils beneath the facility through the use of an SVE system. This action resulted in soils meeting the established SRLs. A decline in TCE concentrations in soil vapor samples collected in the area around the former UST basin was noted ranging from 910 µg/L in 1989 to less than 6.1 µg/L (at a depth of 126 feet bgs) in 2001/2002. Neither TCE, PCE, nor 1,1-DCE were detected above the laboratory detection limits (0.5 µg/L to 1.0 µg/L) in soil vapor at the Layke facility at a depth of 11 feet.

ADEQ granted a No Further Action (NFA) status in 2002, pursuant to A.R.S. §49-287.01. Based on the information provided in the RI, no further remediation of soils within the Layke facility is required; therefore, no remedial objectives specific to soils were provided in the *Proposed Remedial Objectives Report, West Central Phoenix, West Grand Avenue Site, Phoenix, Arizona* (ADEQ, 2005).



### 3.2.3 Groundwater

There are five groundwater plume sites in the WCP area consisting of: (1) the East Grand Avenue Site, (2) North Canal Plume, (3) North Plume, (4) West Grand Avenue Site, and (5) the West Osborn Complex Site. The investigation and cleanup of the other four sites are being conducted under separate WQARF Registries. The COC associated with the WCP WGA Site plume is TCE. The following summarizes the extent of groundwater contamination at the WCP WGA Site:

Groundwater TCE concentrations greater than the AWQS of 5 µg/L have been detected in wells WCP-4 and WCP-10. Concentrations of TCE in WCP-4 ranged from 420 µg/L in May 1992 to below the laboratory detection limit starting in 1999. TCE concentrations in well WCP-10 ranged from 45 µg/L in March 1995 to 5 µg/L in June 2001. Monitoring well WCP-10 was located hydraulically downgradient from the Layke facility. Groundwater elevation in the area has since decreased leaving these two wells dry. Concentrations of 1,1-DCE in groundwater were detected in wells WCP-4 and WCP-10 below the AWQS of 7 µg/L.

Subsequently, monitoring well WCP-235 was installed in May 2008 approximately 23.5 feet east of WCP-10. The TCE concentrations in samples collected from this well ranged from less than 1.0 µg/L to 2.1 µg/L, which are less than the AWQS of 5 µg/L. No PCE or 1,1-DCE were detected at concentrations above their respective laboratory reporting limits. A map depicting the historic and current estimated WCP WGA Site plume boundaries is provided as Figure 1.



## 4.0 SCOPE AND ROLE OF REMEDIAL ACTIONS

### 4.1 OVERALL CLEANUP GOAL

The overall cleanup goal is to address the WCP WGA Site groundwater plume to:

- Satisfy ROs as discussed in Section 5.0
- In accordance with A.R.S. §49-282.06A:
  - ✓ Assure protection of public health and welfare and the environment;
  - ✓ Provide for, as practicable, the control, management or cleanup of the hazardous substances in order to allow the maximum beneficial use of the water of the state; and,
  - ✓ Be reasonable, necessary, cost-effective and technically feasible.

### 4.2 SCOPE OF GROUNDWATER PLUME REMEDIAL ACTIONS

The overall remedial strategies applicable to the WCP WGA Site are:

- Source control - a strategy to eliminate or mitigate a continuing source of contamination.
- Monitoring - a strategy to observe and evaluate the contamination at the WCP WGA Site through the collection of data.
- No action - a strategy that consists of no action at a site.

The source of contamination within the WCP WGA Site is the former UST located within the Layke facility. Response actions taken to date have included the removal of the UST and the installation and operation of a SVE system within the Layke facility. Soil and soil vapor samples collected demonstrated that the SVE system achieved soil remediation levels in the vadose zone.

TCE is the only contaminant historically found in the groundwater within the WCP WGA Site at levels above the AWQs. In 1995, TCE was detected above the AWQS in WCP-4, located within the Layke facility. In 1996, TCE was detected above the AWQS in WCP-4 and WCP-10 (the downgradient well). After the source control was achieved through the completion of the ERA, TCE concentrations in groundwater decreased to less than laboratory reporting limits and only the downgradient portion of the plume (i.e., WCP-10) remained above the AWQS. Thus, the remedial strategy of source control has been achieved within the WCP WGA Site.



The groundwater flow direction and gradient had resulted in TCE movement in a southerly direction. At the time the RI was concluded, the dissolved plume was localized in a small area approximately 900 feet downgradient of the source area. Monitoring well WCP-235 is located in the approximate center of the localized plume. According to the RI report, the horizontal extent of TCE contamination within the WCP WGA Site had been adequately defined by monitoring wells WCP-4, WCP-8, WCP-10 and WCP-11. In addition, the decreasing TCE concentrations observed in monitoring well WCP-235 are an indicator that there is not a vertical component to the TCE dissolved plume. The most recent data indicate that TCE was detected within this well at a concentration of 1.0 µg/L, below the AWQS of 5 µg/L. Based on the information summarized above, the remedial strategy for the WCP WGA Site is a combination of monitoring and no action.

The proposed remedy for the groundwater plume (Section 8.0) will be the final action for the WCP WGA Site to reduce the toxicity, mobility, and/or volume of TCE found in the groundwater that will satisfy the cleanup goals presented in Section 4.1.

The remaining sections of this PRAP describes the ROs specific to the WCP WGA Site plume, and the remedial alternatives evaluation process that lead to the selection of the proposed remedy. Section 9.0 describes the avenues by which this PRAP will be issued for public comments.



## 5.0 REMEDIAL OBJECTIVES

The ADEQ prepared *Proposed Remedial Objectives Report, West Central Phoenix, West Grand Avenue Site, Phoenix, Arizona* (ADEQ, 2005) for the WCP WGA Site to meet the requirements established under A.A.C. R18-16-406. The RO report relied upon the Land and Water Use Report prepared by ADEQ for the WCP WGA Site dated July 2004. No comments pertaining to the RO report were received during the public comment period.

The ROs were 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. The ROs chosen for the WCP WGA Site were evaluated in the FS and a proposed remedy is being identified in this PRAP that satisfies the ROs.

### 5.1 REMEDIAL OBJECTIVES FOR LAND USE

The land within the WCP WGA Site is fully developed (Section 1.2) and land uses for properties in the area are expected to remain predominantly industrial (A-2) or light industrial (A-1). The zoning pattern in the area has been long established, and there are no foreseeable changes for land use in the future.

Soil remediation conducted at the Layke facility using SVE met the soil remediation standards established in A.R.S. §49-152 and A.A.C. R18-7-205 with analytical results obtained from soil samples indicating no detections of TCE. Based on this information, ADEQ granted the NFA request as previously discussed in Section 3.2.2. Therefore, no ROs are needed for current and reasonably foreseeable land use.

### 5.2 REMEDIAL OBJECTIVES FOR GROUNDWATER USE

Current and potential groundwater uses identified within the WCP WGA Site include: 1) the possible future use of groundwater for drinking water purposes by COP; 2) the future use of SRP wells; 3) the future use of the Michigan Trailer Park drinking water well; and 4) the future use of the Danone Water (Danone) drinking water well. The ROs for each of these uses are described below along with a brief description of the current well locations and status.

1. **COP Municipal Use** –The RO for this use is “to restore or provide for the use of the COP groundwater supply if it becomes impacted by the TCE groundwater contamination emanating from the WCP WGA Site. This action would be needed for as long as the level



of contamination in the identified groundwater resource threatens or prohibits its use.” According to the online well database provided by ADWR, there are two COP groundwater supply wells within one mile of the WCP WGA Site (ADWR, 2013). Groundwater supply wells COP-70 and COP-71 (ADWR numbers 55-626552 and 55-626553, respectively) are located southwest (downgradient) from the WCP WGA Site. These wells were removed from service in 1982. A third COP well identified within the ADWR online database, COP-69 located northwest of the WCP WGA Site (not shown on Figure 2), was removed from service in 1988 and abandoned in 2001.

2. **SRP Municipal and Irrigation Use** – The RO for this use is “to protect for the use of the SRP groundwater supply threatened by the TCE contamination emanating from WCP WGA Site should the wells be lost due to changes in groundwater flow direction that would affect the concentration of TCE at the wells. This action would be needed for as long as the level of contamination in the identified groundwater resource threatens or prohibits its use.” The SRP wells in the area of the WCP WGA Site are located either crossgradient or upgradient to the WCP WGA Site. The SRP wells do not appear to be affected by TCE originating from the WCP WGA Site.
3. **Michigan Trailer Park Well Use** – The RO for this use is “to protect for the use of the Michigan Trailer Park groundwater supply threatened by the TCE contamination emanating from WCP WGA Site should the well be lost due to changes in groundwater flow direction that would affect the concentration of TCE at the well. This action would be needed immediately.” The Michigan Trailer Park well is located approximately 950 feet east of and upgradient and crossgradient to the source of the contamination (Layke facility). This well is registered under the ADWR number 55-618512. There are no construction records for this well to indicate whether pumping at the Michigan Trailer Park well extracts water from the same portion of the aquifer as that impacted within the WCP WGA Site, although the RO report (ADEQ, 2005) states that the well depth to be 400 feet.
4. **Danone Water Wells Use** – The RO for this use is “to protect for the use of the Danone groundwater supply threatened by the TCE contamination emanating from WCP WGA Site should the well be lost due to changes in groundwater flow direction that would affect the concentration of TCE at the well. This action would be needed immediately.” The Danone well is located approximately 1,500 feet south-southeast of and crossgradient to downgradient of the Layke facility. In addition, according to the online well database provided by ADWR, a notice of intent to drill a replacement well for the Danone well was filed with ADWR and it was approved on November 27, 2012 (ADWR,



2013). Water withdrawn from both of these wells is obtained from a deeper, non-contaminated aquifer (i.e., the MAU). The current and proposed wells are registered under the ADWR numbers 55-800680 and 55-221831, respectively. It should be noted that the existing Danone Well is located within the East Grand Avenue WQARF Site study area.

### 5.3 BASIS FOR SELECTING CLEANUP LEVELS

This proposed remedy will ensure that TCE concentrations in groundwater are below applicable water quality regulations for drinking water as defined by the following target level:

TCE            5.0 µg/L

The target was selected that would reduce the risk associated with exposure to the groundwater COC to an acceptable level that will satisfy the overall clean up goals (Section 4.1) and the above ROs for groundwater use. The target level for the COC is based on the Arizona AWQS, which is equivalent to EPA's MCL established under the Safe Drinking Water Act.



## 6.0 SUMMARY OF REMEDIAL ALTERNATIVES

The FS Report (URS, 2013) presents the evaluation process used in developing and selecting remedial technologies, remedial measures, prescribed remedial strategies, and discharge considerations. Based on this process, a Reference Remedy was developed along with two alternative remedies referred to as a More Aggressive and Less Aggressive Remedy for comparison in the FS (URS, 2013). The Reference Remedy and each alternative remedy consist of a remedial strategy and measures to achieve the cleanup goals specified in Section 4.1 and the ROs specified in Section 5.0 for the WCP WGA Site. As provided in A.A.C. R18-16-407(F), remedial strategies that were considered when developing the Reference Remedy and each alternative remedy included one or more of the following:

- Plume remediation to achieve water-quality standards for COCs in waters of the state throughout the WCP WGA Site;
- Physical containment to contain contaminants within definite boundaries;
- Controlled migration to control the direction or rate of migration, but not necessarily to contain migration of contaminants;
- Source control to eliminate or mitigate a continuing source of contamination;
- Monitoring to observe and evaluate the contamination at the WCP WGA Site through the collection of data; and
- No action as a strategy that consists of no action at the WCP WGA Site.

Monitoring was considered as an element of the Reference Remedy, as well as the More Aggressive Alternative Remedy. For the Less Aggressive Alternative Remedy, No Action was the selected element based on the availability of historical data demonstrating that the target level for TCE contamination in groundwater has been achieved. Source control of COCs at the Layke Facility has been achieved through the removal of the UST and successful implementation of the SVE system to address contaminated soils underlying the former UST site.

### 6.1 REFERENCE REMEDY

The remedial strategy and measures of the Reference Remedy includes two additional groundwater monitoring and sampling investigations over the period of a calendar year. During each sampling event, the depth to groundwater will be measured at monitoring wells WCP-10 and WCP-235. If sufficient groundwater is present in well WCP-10, a groundwater sample will be collected. A groundwater sample and corresponding duplicate will be collected from well



WCP-235 following low-flow purging of the well. In addition, each sampling event will include collection of an equipment blank. The groundwater samples will be submitted to an Arizona-licensed laboratory for analysis of VOCs in accordance with U.S. EPA Method SW-846 8260B. A monitoring report will be completed at the conclusion of the two sampling events. This report will include a description of the sampling methodologies, a summary of field measurements, a summary of analytical results, a comparison of analytical results to historical data, conclusions, and additional recommendations (if any).

Monitoring wells WCP-10 and WCP-235 are registered under AWDR numbers 55-547462 and 55-908753, respectively. These wells are owned by ADEQ and are located within the COP right-of-way at the approximate address of 3332 West Flower Street. Although the wells are located within the COP right-of-way, they are located within the parking lane of the street, and the City has stated that a lane closure or right-of-way permit is not required to collect a sample from the wells. No other permits or approvals are anticipated at this time.

If, at the conclusion of the two sampling events, TCE concentrations remain less than the AWQS, all wells associated with the WCP WGA Site will be abandoned in accordance with applicable ADWR requirements as promulgated in A.A.C. R12-15-816. A “Notice of Intent to Abandon a Well” will be filed with the ADWR and a Well Abandonment Completion Report will be filed within 30 days of completion of abandonment activities. It is anticipated that a COP closure permit will be required for well abandonment activities.

As previously discussed, source control has been achieved within the WCP WGA Site. ADEQ has granted a NFA with regard to soil contamination at the WCP WGA Site that has successfully been remediated, and the TCE groundwater concentrations are below the AWQS of 5 µg/L. As discussed in the FS report (URS, 2013), the horizontal extent of TCE contamination within the WCP WGA Site has been adequately defined and no vertical component is apparent for the plume.

## 6.2 MORE AGGRESSIVE ALTERNATIVE REMEDY

The More Aggressive Alternative Remedy selected includes a longer time period for the monitoring program. This alternative includes quarterly groundwater monitoring for a period of two years (eight quarters). Groundwater samples will be collected as described above for the Reference Remedy. Results will be reported on an annual basis. As described above, no permits are expected to be required.



If, at the conclusion of the eight sampling events, TCE concentrations remain less than the 5 µg/L AWQS, all wells associated with the WCP WGA Site will be abandoned in accordance with the requirements specified in Section 6.1.

### 6.3 LESS AGGRESSIVE ALTERNATIVE REMEDY

A review of the analytical results from the three rounds of groundwater sampling conducted in 2008, 2012, and 2013 indicate that the groundwater in WCP-235 does not contain concentrations of VOCs that exceed the applicable AWQS. The most recent sampling event (January 2013) reported a TCE concentration of 1.0 µg/L, which is less than the AWQS of 5 µg/L. In addition, the observed concentrations are consistent with the long-term trends for the WCP WGA Site. Based on this information, the Less Aggressive Alternative Remedy selected is no action.

The only activity associated with this alternative is the abandonment of all wells associated with the WCP WGA Site in accordance with the requirements specified in Section 6.1.



## 7.0 EVALUATION OF ALTERNATIVES

In accordance with the Remedy Selection Rule (A.A.C. R18-16-407), the FS was completed to identify a Reference Remedy and two alternative remedies that appear to be capable of achieving ROs. The comparison criteria used in the FS to evaluate each alternative and select a proposed remedy consisted of practicability, cost, risk, and benefit. The comparison of the three remedial alternatives to the evaluation criteria as presented in the FS Report are summarized in the following table.

Alternative Remedies	Practicability	Total Cost	Risk	Benefit
Reference	This remedy is considered to be technically and operationally practicable.	\$32,500	The primary risk is associated with potential changes to groundwater flow direction and gradient as a result of renewed pumping at nearby COP and Salt River Project wells. The TCE concentration meets current regulatory levels; therefore, the potential impact is low.	<ul style="list-style-type: none"> <li>Groundwater already meets current regulatory requirements.</li> <li>The remedy preserves existing land uses.</li> </ul>
More Aggressive	This remedy is considered to be technically and operationally practicable.	\$ 50,000	The primary risk is associated with potential changes to groundwater flow direction and gradient as a result of renewed pumping at nearby COP and Salt River Project wells. The TCE concentration meets current regulatory levels; therefore, the potential impact is low.	<ul style="list-style-type: none"> <li>Groundwater already meets current regulatory requirements.</li> <li>The remedy preserves existing land uses.</li> </ul>
Less Aggressive	This remedy is considered to be technically and operationally practicable.	\$ 23,000	The primary risk is associated with potential changes to groundwater flow direction and gradient as a result of renewed pumping at nearby COP and Salt River Project wells. The TCE concentration meets current regulatory levels; therefore, the potential impact is low.	<ul style="list-style-type: none"> <li>Groundwater already meets current regulatory requirements.</li> <li>The remedy preserves existing land uses.</li> </ul>

### 7.1 PRACTICABILITY

Each of the selected remedies is considered to be technically and operationally practicable.



## 7.2 COST

The least costly alternative is the Less Aggressive Alternative Remedy of no action with a total cost estimate of approximately \$23,000. The Reference Remedy has the median cost of \$32,500 and the More Aggressive Alternative Remedy has the highest cost of \$50,000.

## 7.3 RISK

The risk associated with all three Remedies (and considered to be equal for the three) is primarily associated with potential changes to groundwater flow direction and gradient as a result of renewed pumping at the nearby COP and Salt River Project wells. If TCE has attenuated throughout the WCP WGA Site, as is anticipated, and not just at the source and WCP-10/WCP-235, then the risk associated with nearby pumping wells will be low. However, if dissolved TCE exists at an intermediate point between the source and the monitoring well WCP-235, the dissolved contaminant could be mobilized toward the pumping well. Effects from pumping these wells have not been observed at the WCP WGA Site. This risk is considered to be low.

Pumping at the Michigan Trailer Park and the Danone Well(s) are not expected to result in contaminant transport from the WCP WGA Site. The Danone Well(s) are screened within the Middle Alluvial Unit and the Michigan Trailer Park well is located up- and cross-gradient of the WCP WGA Site. Effects from this well have not been observed at the WCP WGA Site. The risk associated with these wells is considered to be equal for all Remedies.

## 7.4 BENEFIT

A comparison of the benefit of the reference and alternative remedies includes an assessment of the value of the Remedy in terms of lowered risk, decrease in liability, and preservation of existing and future uses. Each Remedy is considered to be of equal benefit based on the current groundwater conditions, wherein dissolved TCE concentrations are 1.0 µg/L or less. Each Remedy also preserves existing land uses.



## 8.0 PROPOSED REMEDY

### 8.1 PROPOSED REMEDY AND RATIONALE FOR SELECTION

The Reference Remedy is recommended as the Proposed Remedy. This recommendation is based on what is considered to be the best combination of remedial effectiveness, practicability, cost, and benefit for restoration and use of the groundwater resource. The Proposed Remedy also:

- Satisfies the overall cleanup goal (Section 4.1) that includes achieving ROs (Section 5.0),
- Is consistent with water management plans, and
- Is consistent with general land use planning.

### 8.2 ACHIEVEMENT OF REMEDIAL OBJECTIVES

The Proposed Remedy achieves the ROs for the WCP WGA Site as described in Section 5.0. The TCE concentrations currently meet regulatory requirements for drinking water.

The Proposed Remedy will address groundwater remediation for the aquifer at the WCP WGA Site. This remedy is designed to achieve the remedial action criteria pursuant to A.R.S. §40-282.06 including the following:

- Assures the protection of public health, welfare and the environment.
- Provides for the beneficial use of the groundwater resource by the COP, the SRP, the Michigan Trailer Park, and the Danone Well(s).
- Is reasonable, necessary, cost-effective, and technically feasible.

### 8.3 CONSISTENCY WITH WATER MANAGEMENT PLANS

URS reviewed the COP's Water Resources Plan, (COP, 2011) to determine if the proposed, remedial actions are generally consistent with the COP's written plans. The disconnection and/or abandonment of the COP's production wells due to water quality concerns and aging equipment has reduced the COP's capability to meet peak demand with groundwater. The COP has identified a need to substantially rebuild its well capacity for drought redundancy, operating flexibility, and system emergencies. In correspondence and discussions with the ADEQ and EPA, the COP has emphasized that the Central Phoenix Aquifer is an important future water supply that the COP will need to be able to access.



**WEST GRAND AVENUE WQARF SITE**

The COP is not currently operating any wells within a one-mile radius of the WCP WGA Site boundary. Two municipal wells (COP wells 70 and 71), located about 0.7 miles southwest of the WCP WGA Site were removed from service in 1982 due to TCE groundwater contamination at the WCP West Osborn Complex Site.

#### **8.4 CONSISTENCY WITH GENERAL LAND USE**

As discussed in the RO Report (ADEQ, 2005), the zoning pattern in the WCP WGA Site area has long been established, and there are no foreseeable changes for the future. Land uses for the Layke facility property and within the WCP WGA Site area are expected to remain predominantly industrial (A-2) or light industrial (A-1).

#### **8.5 LEAD AGENCY STATEMENT FOR REMEDY SELECTION**

Based on information currently available, the ADEQ believes the Proposed Remedy meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. The ADEQ expects the Proposed Remedy to satisfy the remedial action criteria pursuant to A.R.S. §49-282.06 and the ROs as described in Section 5.0.



## 9.0 COMMUNITY PARTICIPATION

### 9.1 PUBLIC COMMENT PERIOD OF PRAP

The public comment period will be no less than 90 days. ADEQ will accept written comments on this PRAP that are postmarked within the comment period and submitted to:

Arizona Department of Environmental Quality  
ATTN: Kevin Snyder, Project Manager  
1110 W. Washington Street  
Phoenix, Arizona 85007

### 9.2 PUBLIC MEETINGS

ADEQ will explain the PRAP and all of the alternatives presented in the FS in a WCP WQARF Site CAB meeting. Oral and written comments will also be accepted at the meeting. The meeting will be held during the 90-day comment period.

### 9.3 ADMINISTRATIVE RECORD

Interested parties can review the PRAP and other WCP WGA Site documents at the Burton Barr Central Library (Arizona Room) located at 1221 N. Central Avenue in Phoenix (602) 262-4636.

The complete official Site file can also be reviewed at the ADEQ Main Office located at 1110 W. Washington Street, Phoenix. With 24-hour notice, an appointment to review related documentation is available Monday through Friday from 8:30 a.m. to 4:30 p.m., at the ADEQ Records Management Center. Please contact (602) 771-4380 or (800) 234-5677 to schedule an appointment to review these documents.

### 9.4 OTHER CONTACT INFORMATION

Name/Title/Address	Phone/Fax	E-mail
Kevin Snyder, ADEQ Project Manager	(602) 771-4186 (602) 771-4138 fax	<a href="mailto:kcs@azdeq.gov">kcs@azdeq.gov</a>
Wendy Flood, ADEQ Community Involvement Coordinator	(602) 771-4410 (602) 771-4138 fax	<a href="mailto:wv1@azdeq.gov">wv1@azdeq.gov</a>



## 10.0 REFERENCES

- A.A.C. R12-15-816. Arizona Administrative Code, Title 12 – Natural Resources, Chapter 15 – Department of Water Resources, Article 8 – Well Construction and Licensing of Well Drillers, Section 816 – Abandonment. Effective March 5, 1984.
- A.A.C. R18-7-205. Arizona Administrative Code, Title 18-Environmental Quality, Chapter 7- Department of Environmental Quality Remedial Action, Article 2 - Soil Remediation Standards, Section 205 –Pre-determined Remediation Standards. Effective May 5, 2007.
- A.A.C. R18-11-400. Arizona Administrative Code, Title 18-Environmental Quality, Chapter 11, Article 4, Section 400 – Numeric Aquifer Water Quality Standards. Effective May 26, 1994.
- A.A.C. R18-16-406. Arizona Administrative Code, Title 18-Environmental Quality, Chapter 16, Article 4, Section 406 – Remedial Investigations. Effective March 4, 2002.
- A.A.C. R18-16-407. Arizona Administrative Code, Title 18-Environmental Quality, Chapter 16, Article 4, Section 407 – Feasibility Study. Effective March 4, 2002.
- A.A.C. R18-16-408. Arizona Administrative Code, Title 18-Environmental Quality, Chapter 16, Article 4 – Proposed Remedial Action Plan. Effective March 4, 2002.
- ADEQ, 2004. Draft Remedial Investigation Report, West Central Phoenix, West Grand Avenue Site, Phoenix, Arizona. January 2004.
- ADEQ, 2005. Proposed Remedial Objectives Report, West Central Phoenix, West Grand Avenue Site, Phoenix, Arizona. May 2005.
- ADEQ, 2012. West Central Phoenix (WCP) West Grand Avenue, Water Quality Assurance Revolving Fund (WQARF) Site. <http://www.azdeq.gov/environ/waste/sps/download/phoenix/wcpega/wcpwga.pdf>. July 2012.
- ADWR, 2013. Well Registry Web, <https://gisweb.azwater.gov/waterresourcedata/WellRegistry>.
- A.R.S. §49-152. Arizona Revised Statute Title 49, Section 152, Soil remediation standards; restrictions on property use.
- A.R.S. §49-282.06A. Arizona Revised Statute Title 49, Section 282.06, Remedial action criteria; rules.
- A.R.S. §49-287.01. Arizona Revised Statute Title 49, Section 287.01, Investigation scoring and site registry; no further action.



- A.R.S. §49-287.03. Arizona Revised Statute Title 49, Section 287.03, Remedial investigation and feasibility study.
- A.R.S. §49-287.04. Arizona Revised Statute Title 49, Section 287.04, Proposed remedial action plan; preliminary list of responsible parties; opportunity to comment; record of decision; appeal.
- COP, 2011. City of Phoenix Water Resource Plan. Water Services Department.  
[http://phoenix.gov/webcms/groups/internet/@inter/@dept/@wsd/documents/web\\_content/wsd2011wrp.pdf](http://phoenix.gov/webcms/groups/internet/@inter/@dept/@wsd/documents/web_content/wsd2011wrp.pdf) Accessed January 3, 2014.
- Corkhill, E.F., S. Corell, B.M. Hill, and D.A. Carr, 1993. *A Regional Groundwater Flow Model of the Salt River Valley – Phase I*. Arizona Department of Resources Modeling Report No. 6. 1993.
- Locus Technologies (Locus), 2008. Summary of Well Installation Activities, ADEQ Layke/West Central Phoenix Water Quality Assurance Revolving (WQARF) Area, October 2008.
- URS, 2013. Final Feasibility Study for West Central Phoenix, West Grand Avenue WQARF Site. June 2013.

## **FIGURES**

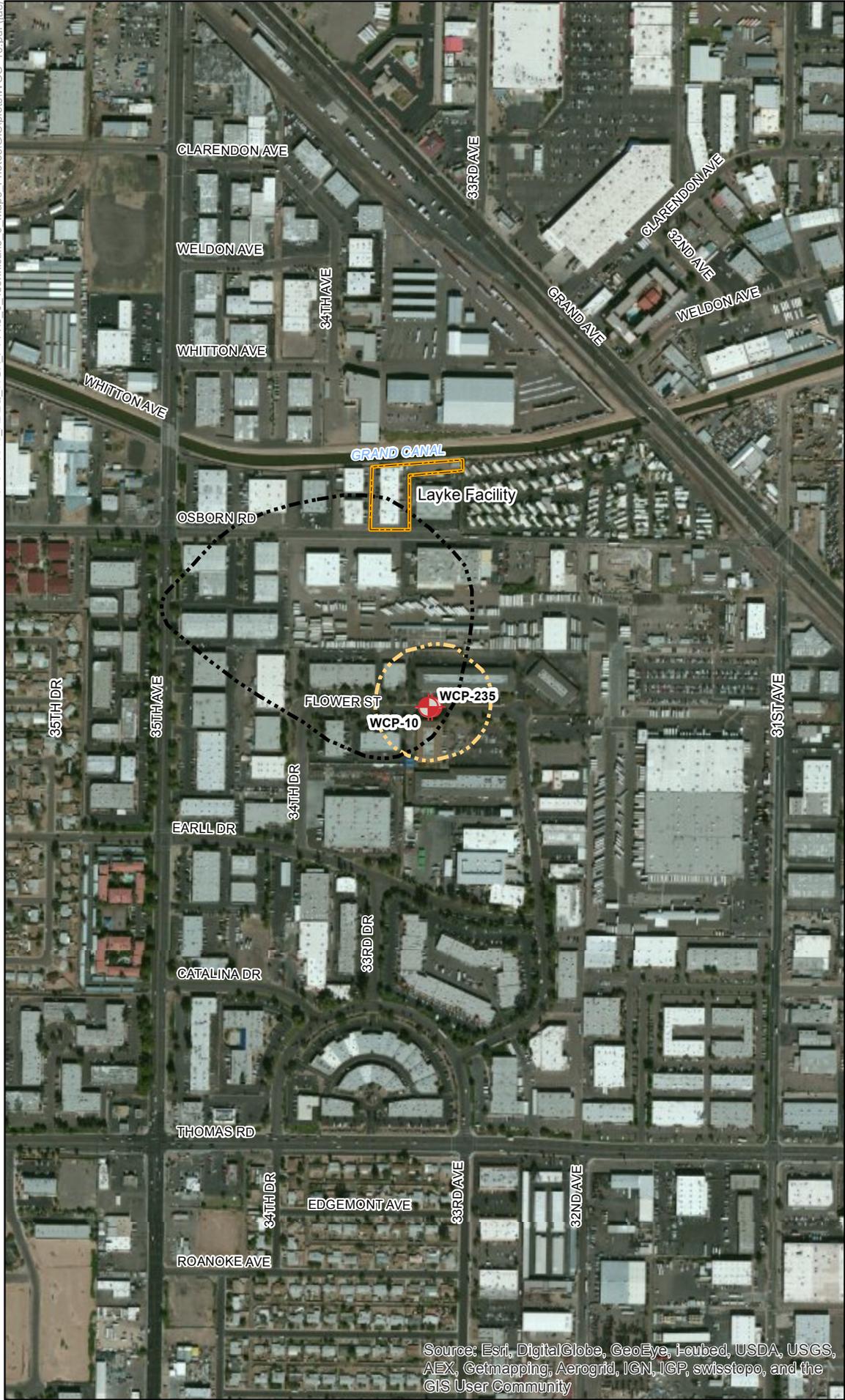


Figure 1  
Boundaries of the WCP WGA Site

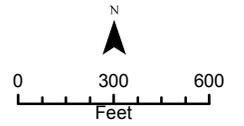
West Central Phoenix (WCP)  
West Grand Avenue (WGA)  
WQARF Site  
Phoenix, AZ

**Legend**

-  Well
-  Current Estimated Plume Boundary
-  Former Estimated Plume Boundary
-  Layke Facility



Source:  
Map Features: ADOT 2012,  
ADEQ 2012, URS 2013  
Imagery: Bing(c) 2010 Microsoft  
Corporation



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS,  
AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the  
GIS User Community



