ADEQ Arizona Department of Environmental Quality

TECHNICAL SUPPORT DOCUMENT

PROPOSED UNDERGROUND STORAGE TANK (UST) RELEASE CASE CLOSURE EVALUATION SUMMARY

LUST Case File #: 4222.01, .02, .04
Facility ID # 0-001071
Maricopa County

former Chevron Service Station No. 9-7019
1002 West University Drive
Tempe, Arizona 85281

Background:
On behalf of Chevron Environmental Management Company (CEMC), Arcadis U.S., Inc. (Arcadis) has evaluated current groundwater and soil conditions at Former Chevron #97019. The site is located at 1002 West University Drive in Tempe, Arizona. The site encompasses an area of approximately 25,265 square feet, of which all is developed. The site is not owned by Chevron and is currently operated as an O'Reilly's Auto Parts Store and currently zoned for Commercial Shopping and Service (CSS). The site is bounded by an apartment complex to the north and by South Hardy Drive to the east, a tattoo parlor to the west, and by West University Drive to the south.

A UST system was installed on or before January 1982, according to ADEQ files. In September 1995, during the removal of the former USTs and components, releases were identified and found to be associated with the 10,000-gallon Northern UST (LUST no. 4222.01), the 10,000-gallon Central UST (LUST no. 4222.02), the 1,000-gallon Used-Oil UST (LUST no. 4222.03-closed in December 2000), and the South Pump Island Area (LUST no. 4222.04). Subsequent investigations indicated soil and groundwater had been impacted by gasoline hydrocarbons (primarily Benzene, Toluene, Ethylbenzene and Xylenes [BTEX] and other volatile organic compounds [VOCs]). ADEQ issued Approval of Site Characterization in November 2006. Chevron requested case closure in 2010, but it was denied by ADEQ.

Removal or control of the source of contamination:
Early remedial activities are limited in description. During UST permanent closure, 300 tons of soil was over-excavated and disposed of in September 1995. Free product recovery utilizing absorbent socks in MW-1 was periodically conducted from 1997 to 2005. A vapor extraction (VE)/ air sparge (AS) system was in operation from November 2008 to September 2009.

Monitored natural attenuation has been ongoing at the site since remedial system was shut down in 2009 due to low, asymptotic VOC concentrations in extracted soil vapor. The remediation equipment (trailer mounted thermal/catalytic oxidizer and air compressor) was removed from the site between September 3 and 4, 2014. The equipment compound, above-ground manifold piping and electrical connections were left in place.

Characterization of the groundwater plume:
Historically, BTEX constituents and methyl tert butyl ether (MTBE) were considered chemicals of concern (COCs) as they are typically associated with gasoline releases and were detected at concentrations in groundwater that exceeded their respective Aquifer Water Quality Standard

(AWQS) or Tier 1 risk-based levels. Benzene is currently the only COC in groundwater that meets this criteria and is considered the primary risk driver and the focus of the closure assessment.

All documentation and the conceptual site model indicate the groundwater affected by the gasoline release is characterized. The horizontal extent is well defined by a perimeter of monitoring wells with concentrations of COCs less than the AWQS in all four primary flow directions (up gradient [north], down gradient [south], and cross-gradient [east/west],

Since 1996, depth to groundwater has ranged from approximately 31 to 58 feet bgs. The shallowest depth to groundwater was recorded at the site during October 2011 at 30.71 feet bgs (MW-1). Groundwater elevation data for the reporting period Fourth Quarter 2019, suggests a west-southwest component to groundwater flow and a hydraulic gradient of 0.013 feet/foot. Data for the current reporting period is consistent with historical data in which groundwater flow direction has been to the west, southwest or south at a shallow hydraulic gradient of approximately 0.010 feet/foot.

Groundwater plume stability:
The benzene dissolved-phase plume has reduced in size over time and that the current plume is localized on-site. Benzene concentrations in groundwater greater than the AWQS of 5 µg/l are limited to a small footprint in the area of well MW-1. The 2019 plume footprint is substantially smaller than the maximum extent plume footprints and has been shrinking for about a decade. The approximate area of the benzene plume footprint reduced from a maximum extent of 59,070 square feet (ft^2) to 880 ft^2 in December 2019 representing a 99 percent (%) reduction in size.

Benzene concentrations have decreased substantially since March 2014, indicating a receding (shrinking) plume. The maximum benzene concentration decreased from 14,000 µg/L in January 2001 to 230 µg/L in December 2019. Dissolved phase benzene concentrations have also decreased from above the AWQS to less than the AWQS in the other monitoring wells.

The statistical analysis of the concentration trends of benzene over time at source area monitoring well MW-1 using Mann-Kendall was completed. The available historical data was evaluated. Results presented in the closure report show that the benzene concentration trend at monitoring well MW-1 was downward (significantly decreasing).

Linear regression analyses using natural log-normalized concentrations of benzene was conducted to estimate trend direction, attenuation rates, and, approximate time to achieve the relevant AWQS. The linear regression analysis was completed for monitoring well MW-1 only, as this well exceeded the AWQS for the most recent sampling event. The entire dataset for monitoring well MW-1 was initially screened for large fluctuations in concentrations. Where large historical fluctuations and active remediation occurred, a more recent timeframe was chosen starting from the maximum concentration measured following the final conclusion of nearby active groundwater remediation (i.e., following rebound).

Results from the linear regression analysis indicate that benzene concentrations in MW-1 exhibit a statistically significant decreasing trend and support the occurrence of natural attenuation of benzene at the site. The majority of COCs in monitoring wells are currently below the relevant AWQS. Based on monitoring well MW-1 (the well with the highest benzene concentrations), the groundwater is expected to reach the AWQS by 2028 (i.e., in approximately 8 years).

Natural Attenuation:
Natural attenuation processes include diffusion, dispersion, sorption, volatilization, and biodegradation. A decreasing trend in VOC concentrations in groundwater has been established, which supports that natural attenuation is occurring. Hydrologic and geochemical data can be used to indirectly demonstrate the type(s) of natural attenuation processes.

In accordance with the ADEQ guidance and industry standards, multiple lines of evidence were used to evaluate natural attenuation at the site. The lines of evidence used were the continued stability and decline of dissolved constituents in the groundwater plume, the magnitude and distribution of geochemical parameters indicative of natural attenuation processes, and the assimilative capacity of the aquifer system as evaluated by geochemical parameters.

An assessment of biogeochemical conditions and indicator parameter results at the site is presented as a secondary line of evidence for the effectiveness of natural attenuation of the plume. Degradation of petroleum hydrocarbons in groundwater can proceed via aerobic or anaerobic microbial processes. Bacteria present in soil and groundwater obtain energy for cell production and maintenance by facilitating thermodynamically advantageous oxidation-reduction reactions involving the transfer of electrons from electron donors to available electron acceptors. When sufficient dissolved oxygen (DO) is present in groundwater, biodegradation of hydrocarbons proceeds aerobically (with oxygen as the electron acceptor). As oxygen becomes less available, anaerobic microorganisms consume electron acceptors in the following order of preference: nitrate, manganese (IV), iron (III), sulfate, and carbon dioxide.

The following geochemical indicator parameters were collected as part of routine monitored natural attenuation evaluations from February 2018 to December 2019: manganese, methane, sulfate, total nitrate, and total nitrite. In addition, DO, oxidation reduction potential (ORP), and ferrous iron field measurements were collected.

Comparison of geochemical indicators (DO, ORP, and sulfate) in monitoring wells collected during the December 2019 groundwater sampling event is presented in the closure report. Data indicate depleted levels of DO and sulfate, and a negative redox value in the source area (MW-1) compared to background concentrations suggesting anaerobic biochemical reactions that consume BTEX (organic compounds) are occurring.

As groundwater moves through the source area well MW-1, electron acceptors (DO and sulfate) are consumed and concentrations decrease. ORP in the source area well MW-1 decreases, indicating a reduced groundwater chemistry. DO and sulfate concentrations and ORP then increase to background concentrations down gradient from the plume. These signature changes are precisely those expected and demonstrated at many sites and are accepted as a secondary line of evidence for evaluating the effectiveness of natural attenuation.

Using the Air Force Center for Environmental Excellence protocol for evaluating intrinsic bioremediation, if the groundwater's assimilative capacity for BTEX exceeds the dissolved BTEX concentrations at the site, it can be concluded that intrinsic bioremediation is capable of controlling and naturally reducing the area of impact. The average total assimilative capacity of the natural groundwater beneath the site for the period from February 2018 to December 2019 and considering only DO, sulfate, and nitrate is conservatively estimated to be approximately 40 mg/L of a BTEX surrogate. In comparison, the maximum average total BTEX concentration at the site observed for the period from February 2018 to December 2019 was 0.451 mg/L in the samples collected from MW-1. Based on the calculation described above, the natural groundwater's assimilative capacity (40 mg/L) continues to significantly exceed the maximum average BTEX concentrations observed at the site. The assimilative capacity has been adequate to control and naturally reduce the petroleum hydrocarbons (including BTEX) for two years and is expected to remain that way for the foreseeable future.

The BIOSCREEN model was used to simulate remediation through natural attenuation of dissolved benzene at the site. Model inputs were chosen in accordance with the BIOSCREEN Natural Attenuation Decision Support System User's Manual version 1.3 and are presented in the closure report. Where appropriate site-specific data were used. The model was run assuming an infinite source. Assuming the source area to be the location of MW-1, the source area is approximately 60 feet from the property boundary in the direction of contaminant transport. The results for the instantaneous reaction model suggest that benzene concentrations will reach the point of compliance, i.e. the AWQS of 5 ug/L, 102 feet from the source area. However, site data indicate that 102 feet is an overestimation and that benzene concentrations are less than 5 ug/L at the property boundary and off-site. MW-4 is located on site and is down gradient of MW-1. MW-3 is located approximately 5 feet off-site in a City right of way. Both these wells had benzene concentrations less than 5 ug/L in December 2019. Although the BIOSCREEN model overestimates the distance from the source at which benzene would be below the point of compliance (i.e., the AWQS), data suggests that benzene is naturally attenuating to concentrations that are below the AWQS before reaching sensitive receptors.

A benzene plume reduction of 99% was determined by comparing the current plume extent to the historical maximum plume extent. Based on these biogeochemical conditions, assimilative capacity, results of the linear regression statistical analysis, BIOSCREEN modelling results, and reduction of the benzene plume that has occurred to date, natural attenuation of the LUST-affected groundwater plume is occurring and is expected to continue.

Threatened or impacted drinking water wells:
Arcadis conducted a desktop well search using the Arizona Department of Water Resources (ADWR) well inventory database, in April 2020. There are no potable water supply wells or domestic water supply wells within ¼ mile of the LUST-affected groundwater; the wells identified during the search were environmental compliance wells. ADEQ conducted a well search within ½ mile of the LUST site. A total of 24 wells were identified, of which 21 are monitoring wells, two are cathodic protection wells, and one a geotechnical well.

According to the City of Tempe webpage, the drinking water in Tempe is produced at two water treatment plants. The Johnny G. Martinez Treatment Plant in North Tempe near Papago Park and the South Tempe Water Treatment Plant, located in the southern part of the city.

Each plant receives surface water originating from various sources, including the Salt River, Verde River and Central Arizona Project (CAP, Colorado River) watersheds. The water is delivered via the Salt River Project (SRP) canal system. The Johnny G. Martinez plant is located on the Crosscut canal, which receives water from SRP's Arizona canal. While the South plant is located on the Tempe canal, which receives water from SRP's South canal.

Additional water sources include SRP and Tempe wells. SRP has many wells located along the canal system throughout the valley. Tempe also has several wells, located throughout the city that can pump chlorinated water directly to the distribution system. Tempe wells are pumped to the system when necessitated by water demand. There are no City of Tempe or SRP wells located within 1 mile of the LUST site according to the desktop well survey conducted.

ADWR restricts the installation of any new non-municipal water supply wells in Active Management Areas (AMAs) with existing water supply distribution systems. The site is included in such a restricted area. According to ADWR, any new or replacement well located at or near this LUST site would need to meet the criteria of A.A.C. R12-15-1302 (B) (3).

Other exposure pathways:
Historically, benzene and total xylenes have been the site COCs in soil. Soil sample 2TE-20, collected at 20 feet bgs, had a total xylenes concentration of 53 milligram per kilogram (mg/kg) exceeding the minimum Groundwater Protection Limit (GPL) of 31 mg/kg. Soil sample IDW-11, collected at 11 feet bgs, had a benzene concentration of 1.2 mg/kg and a total xylene concentration of 94 mg/kg exceeding the rSRL of 0.65 mg/kg and the GPL of 31 mg/kg. Soil samples collected from SB-1 at 15, 40, and 50 feet bgs had total xylenes concentrations of 84, 180, and 60 mg/kg, respectively, which exceeded the GPL of 31 mg/kg. The soil sample collected from SB-2 at 45 feet bgs had a benzene concentration of 0.92 mg/kg exceeding the rSRL of 0.65 mg/kg.

In January 2020, soil borings B-11, B-12, and SSA-1 were advanced and confirmation soil samples were collected to assess COC concentrations in vadose zone soils in the source area in proximity to historical soil exceedances. Collected soil samples were submitted under standard chain of custody protocols to TestAmerica for analysis of: VOCs and TICs in accordance with USEPA Method 8260B, TEL in accordance with USEPA Method 8270C and PAHs in accordance with USEPA Method 8270C. BTEX, MTBE, and additional VOCs were not detected in the samples. However, PAHs were detected but were below ADEQ rSRLs in one or more samples. TEL was not detected in any of the samples collected.

The results confirmed that xylene concentrations at 2TE-20, IDW-11, and SB-1 (15 feet bgs) were below the GPL of 31 mg/kg and that benzene concentrations at IDW-11 were below the rSRL of 0.65 mg/kg for benzene. Due to shallow refusal, xylene exceedances at SB-1 (40 and 50 feet bgs) and a benzene exceedance at SB-2 (45 feet bgs) could not be confirmed. However, it should be noted that groundwater levels in MW-1, closest to SB-1, were approximately 39 feet bgs and groundwater levels in MW-3, closest to SB-2, were approximately 41 feet bgs during the fourth quarter groundwater 2019 monitoring event. Therefore, if soil samples were collected from these locations, they would have been collected below the water table and been saturated. For the fourth quarter groundwater monitoring event, total xylene concentrations in groundwater were 20 ug/L at MW-1 and benzene was not detected in MW-3 (reporting limit of 2.0 ug/L), both of which are below the AWQS of 10,000 µg/L.

Although the soil confirmation boring showed no VOC contamination, the vapor intrusion pathway was evaluated using previously collected soil vapor data to assess all potential exposure pathways. At the request of the ADEQ, soil vapor data were reassessed using a residential scenario instead of a commercial scenario.

As an initial screening step, available soil gas (2017) and groundwater concentrations collected over the past two years at locations near inhabited buildings were compared to the USEPA Vapor Intrusion Screening Levels (VISLs) to determine whether further evaluation (i.e., vapor intrusion modeling) was required.

Arcadis evaluated the soil vapor data using the Johnson & Ettinger model, using typical residential parameters. The estimated total cancer risk and non-cancer hazard index for potential exposure to vapors in indoor air by future residential property receptors from subsurface impacts is 4 x 10-6 and 0.99, respectively. The modeling demonstrates the inhalation exposure route shows an acceptable cancer and non-cancer risk for petroleum related CoCs. The estimated total cancer risk and non-cancer hazard index for potential exposure to vapors in indoor air by current and future commercial workers at the site property from subsurface impacts are 1 x 10-6 and 0.09, respectively.

The maximum benzene and ethylbenzene concentrations (440 µg/L and 240 µg/L, respectively at MW-01) exceeded the target commercial groundwater VISLs (6.93 µg/L and 15.2 µg/L, respectively). Therefore, vapor intrusion modeling was completed for the residential and commercial scenarios for onsite groundwater. To be conservative, all detected onsite groundwater constituents were modeled.

Commercial properties are located to the east, south, and west of the Site. Specifically, a restaurant is located to the southeast of the Site and a Circle K branded convenience store is located to the south of the Site, which are both located across University Drive.
A residential property (apartment complex) is located adjacent north and west of the Site in addition to the residences located south of the restaurant across University Drive. No sensitive receptors were found within ¼ mile.

The maximum concentrations in all offsite groundwater did not exceed the respective target commercial or residential groundwater VISLs; therefore, vapor intrusion modeling was not completed for offsite groundwater.

Requirements of A.R.S. §49-1005(D) and (E):
The results of the corrective action completed at the site assure protection of public health, welfare and the environment, to the extent practicable, the clean-up activities competed at this site allow for the maximum beneficial use of the site, while being reasonable, necessary and cost effective.

Other information that is pertinent to the LUST case closure approval:
The facility and LUST files were reviewed for information regarding prior cleanup activities, prior site uses and operational history of the UST system prior to removal.

Groundwater data tables representing source area and down gradient conditions:

Well ID	ADWR Registration #	Date Installed	Well location/address	Consultant	Purpose	Well Depth (feet)	Diameter (inches)	Screen Interval (feet)
MW-1	55-553119	12/21/1995	1002 W. University Dr., Tempe, AZ 85281	Delta	GWM	80	4	35-80
MW-3	55-553121	1/31/1996	1002 W. University Dr., Tempe, AZ 85281	Delta	GWM	78.5	4	23.5-78.5
MW-4	55-553122	2/1/1996	1002 W. University Dr., Tempe, AZ 85281	Delta	GWM	80	4	25-80
MW-5	55-553123	11/18/1996	1002 W. University Dr., Tempe, AZ 85281	ATC	GWM	80	4	40-80
MW-6	55-590572	3/30/2002	University Dr. Right-of-Way	HFA	GWM	80	4	30-80
MW-7	55-597802	9/16/2003	9th Street Right-of-Way	HFA	GWM	80	4	30-80
MW-8	55-597803	9/18/2003	University Dr. Right-of-Way	HFA	GWM	80	4	30-80
MW-9	55-597803	8/30/2018	1006 W. University Dr.	AECOM	GWM	80	4	30-80

Notes:
GWM = Groundwater monitoring well
Abandoned well MW-2 registered as 55-553120 in ADWR Well Registry Database

Primary COC Analytical Results - Fourth Quarter 2019

Well ID	Benzene (µg/L)	Benzene 2-year Average (µg/L)
AWQS	5	5
MW-1	**230 D2**	**274**
MW-3	<2.0	NA
MW-4	<2.0	**19**
MW-5	<2.0	NA
MW-6	<2.0	NA
MW-7	<2.0	NA
MW-8	<2.0	NA
MW-9*	<2.0	NA

Notes:
Bolded values indicate the concentration exceeded the AWQS (5 µg/L for benzene)
µg/L = micrograms per liter
< = indicates the constituent was below the specified laboratory reporting limit (used 0 in averaging concentration)
*Well was installed on August 30, 2018 and has been sampled six times.
D2 = Sample required dilution due to high concentration of analyte
NA = not applicable – recent concentrations were below laboratory reporting limits

Groundwater data for MW-1 (source)

Date	Benzene AWQS 5.0 µg/L	Depth to Water (feet)
March 1996	**3,800**	40.42
January 2001	**14,000**	46.39
January 2005	**1,200**	55.97
July 2008	**760**	37.73
VE/AS 2008-2009		
December 2009	**660**	35.52
March 2010	**48**	34.05
March 2011	4.1	31.92
March 2012	**520**	32.19
March 2013	**710**	39.75
March 2014	**4,600**	44.75
March 2015	**940**	49.12
March 2016	**380**	47.36
May 2017	**130**	41.90
November 2017	**240**	41.69
May 2018	**380**	41.97
November 2018	**200**	40.32
March 2019	**170**	40.43
June 2019	**300**	39.07
September 2019	**400**	40.60
December 2019	**230**	39.02

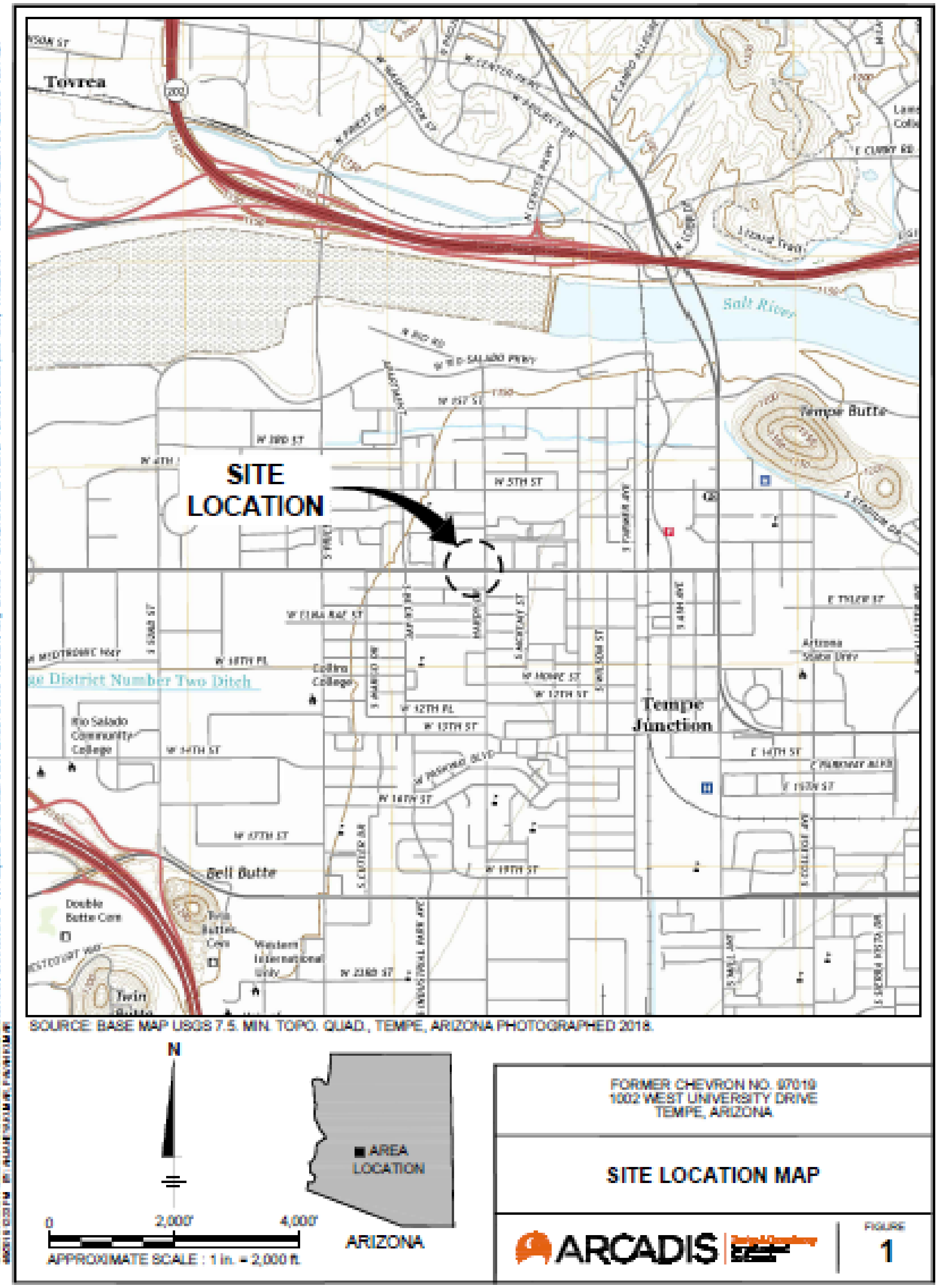
Groundwater data for MW-4 (down gradient on-site)

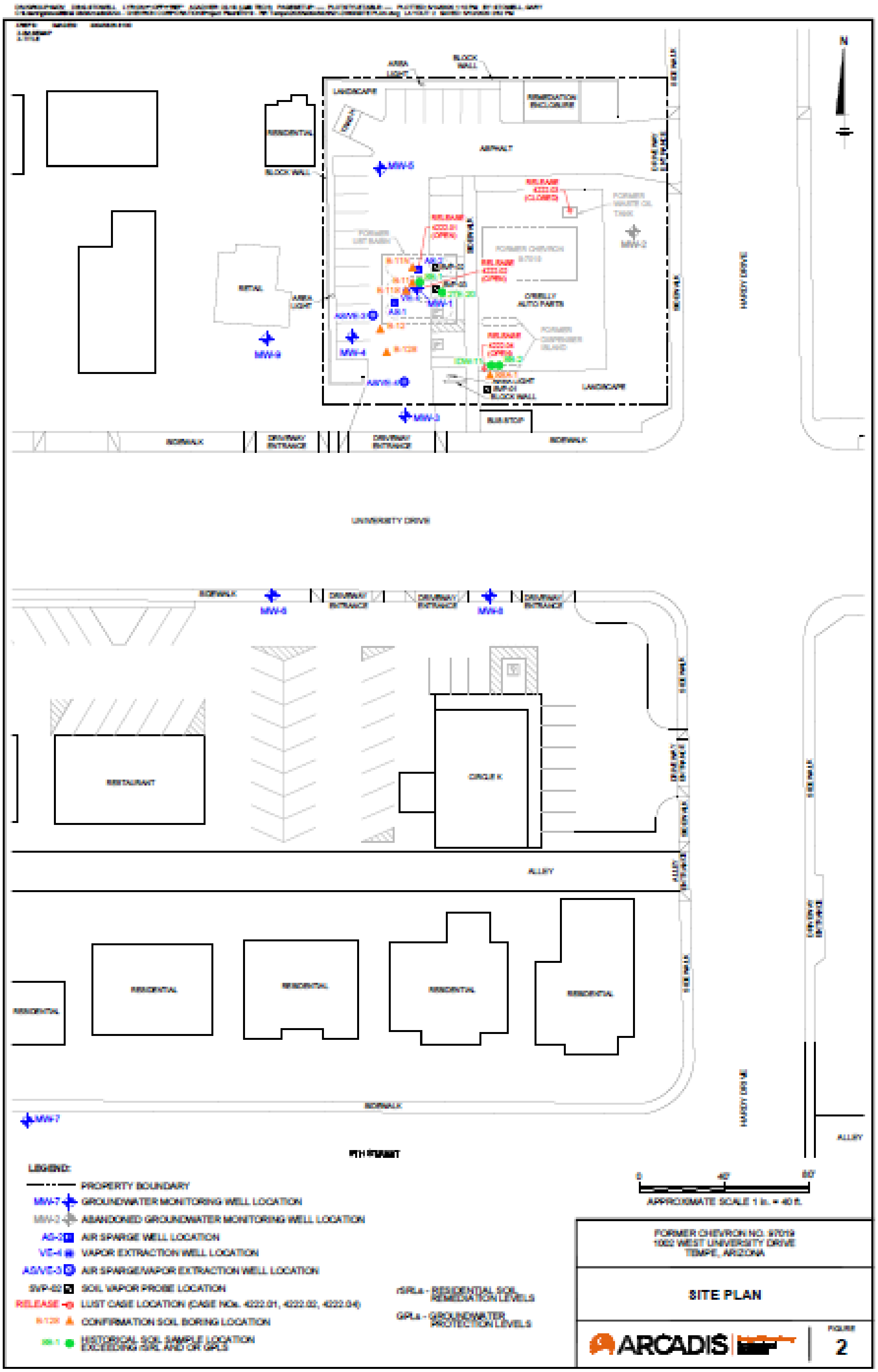
Date	Benzene AWQS 5.0 µg/L	Depth to Water (feet)
March 1996	**1,200**	39.62
April 1997	**1,400**	48.62
April 1998	**2,000**	47.50
January 2001	**9,800**	---
January 2005	**20**	56.69
July 2008	**290**	38.90
VE/AS 2008-2009		
December 2009	**43**	36.60
March 2010	1.4	35.19
March 2011	<1.0	33.10
March 2012	<1.0	33.32
March 2013	**240**	40.90
March 2104	**51**	45.91
March 2015	**600**	50.32
March 2016	**94**	48.54
May 2017	**70**	43.04

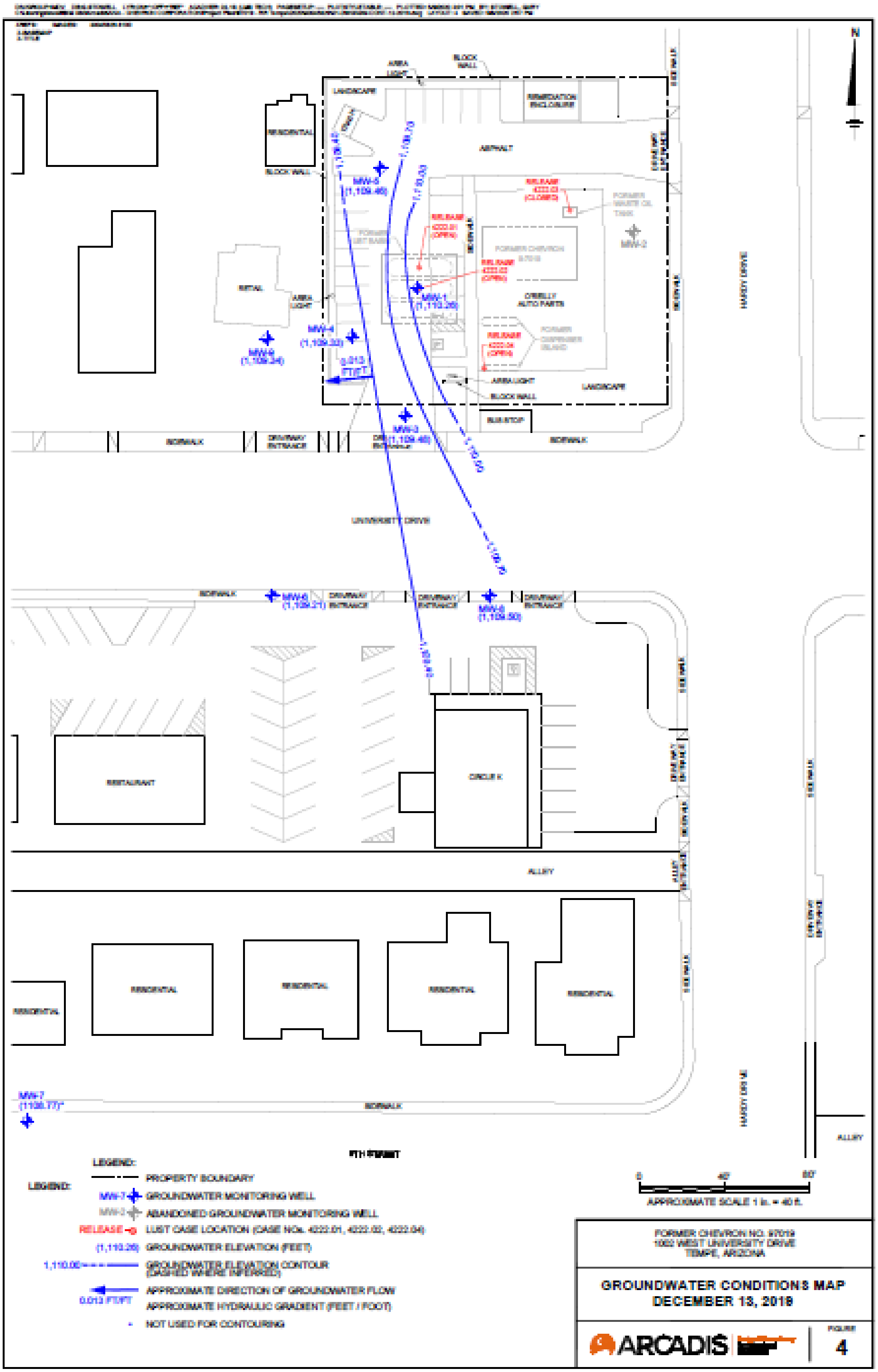
November 2017	**69**	42.85
May 2018	**57**	43.17
November 2018	4.8	41.51
March 2019	<0.50	41.61
June 2019	<2.0	40.31
September 2019	<2.0	41.61
December 2019	<2.0	40.50

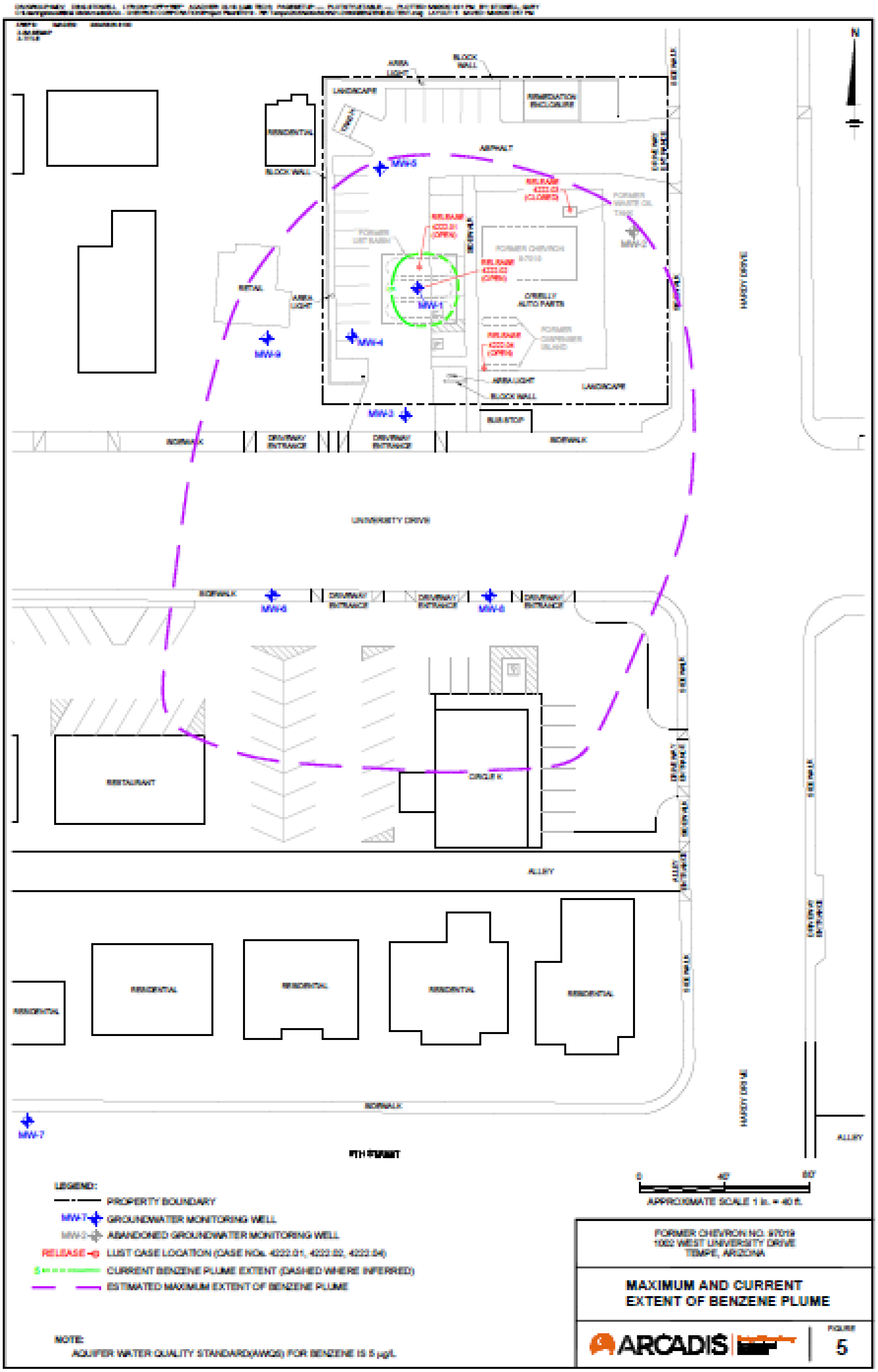
MW-9 (down gradient off site)

Date	**Benzene AWQS 5.0 µg/L**	**Depth to Water (feet)**
August 2018 – well installation		
September 2018	<0.50	42.76
November 2018	<0.50	40.40
March 2019	<0.50	40.53
June 2019	<2.0	39.06
September 2019	<2.0	40.60
December 2019	<2.0	39.37


SITE LOCATION
Tovrea
Salt River
Tempe Butte
Tempe Junction
Bell Butte
Arizona State Univ
Rio Salado Community College
Collins College
Western International Univ
Double Butte Cem
Twin Buttes Cem
W 5TH ST
W 3RD ST
W 1ST ST
W 12TH ST
W 13TH ST
W 14TH ST
W 17TH ST
W 19TH ST
W 22ND ST
E 14TH ST
E 15TH ST
E TYLER ST
W RIO SALADO PKWY
SOURCE: BASE MAP USGS 7.5 MIN. TOPO. QUAD., TEMPE, ARIZONA PHOTOGRAPHED 2018.
N
0
2,000'
4,000'
APPROXIMATE SCALE : 1 in. = 2,000 ft.
AREA LOCATION
ARIZONA
FORMER CHEVRON NO. 97019
1002 WEST UNIVERSITY DRIVE
TEMPE, ARIZONA
SITE LOCATION MAP
ARCADIS
FIGURE
1


N
AREA LIGHT
BLOCK WALL
LANDSCAPE
REMEDIATION ENCLOSURE
ASPHALT
RESIDENTIAL
BLOCK WALL
MW-5
FORMER WASTE OIL TANK
MW-2
FORMER CHEVRON 97019
O'REILLY AUTO PARTS
FORMER DISPENSER ISLAND
RETAIL
AREA LIGHT
MW-9
MW-4
MW-1
MW-3
BUS STOP
LANDSCAPE
SIDEWALK
DRIVEWAY ENTRANCE
HARDY DRIVE
UNIVERSITY DRIVE
MW-6
MW-8
RESTAURANT
CIRCLE K
ALLEY
RESIDENTIAL
MW-7
9TH STREET
LEGEND:
PROPERTY BOUNDARY
MW-7 GROUNDWATER MONITORING WELL LOCATION
MW-2 ABANDONED GROUNDWATER MONITORING WELL LOCATION
AS-2 AIR SPARGE WELL LOCATION
VE-4 VAPOR EXTRACTION WELL LOCATION
AS/VE-3 AIR SPARGE/VAPOR EXTRACTION WELL LOCATION
SVP-02 SOIL VAPOR PROBE LOCATION
RELEASE LUST CASE LOCATION (CASE NOs. 4222.01, 4222.02, 4222.04)
CONFIRMATION SOIL BORING LOCATION
HISTORICAL SOIL SAMPLE LOCATION EXCEEDING rSRL AND OR GPLS
rSRLs - RESIDENTIAL SOIL REMEDIATION LEVELS
GPLs - GROUNDWATER PROTECTION LEVELS
0 40' 80'
APPROXIMATE SCALE 1 in. = 40 ft.
FORMER CHEVRON NO. 97019
1002 WEST UNIVERSITY DRIVE
TEMPE, ARIZONA
SITE PLAN
ARCADIS
FIGURE
2


UNIVERSITY DRIVE
HARDY DRIVE
ALLEY
SIDEWALK
RESTAURANT
CIRCLE K
RESIDENTIAL
RETAIL
ASPHALT
LANDSCAPE
O'REILLY AUTO PARTS
MW-1 (1,110.26)
MW-3 (1,109.40)
MW-4 (1,109.32)
MW-5 (1,109.46)
MW-6 (1,109.21)
MW-8 (1,109.50)
MW-9 (1,109.34)
MW-7 (1108.77)*
0.013 FT/FT
LEGEND:
PROPERTY BOUNDARY
GROUNDWATER MONITORING WELL
ABANDONED GROUNDWATER MONITORING WELL
LUST CASE LOCATION (CASE NOs. 4222.01, 4222.02, 4222.04)
GROUNDWATER ELEVATION (FEET)
GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
APPROXIMATE DIRECTION OF GROUNDWATER FLOW
APPROXIMATE HYDRAULIC GRADIENT (FEET / FOOT)
NOT USED FOR CONTOURING
APPROXIMATE SCALE 1 in. = 40 ft.
FORMER CHEVRON NO. 97019
1002 WEST UNIVERSITY DRIVE
TEMPE, ARIZONA
GROUNDWATER CONDITIONS MAP
DECEMBER 13, 2019
ARCADIS
FIGURE
4


N
LANDSCAPE
REMEDIATION ENCLOSURE
ASPHALT
MW-5
RESIDENTIAL
BLOCK WALL
RETAIL
MW-9
MW-4
MW-1
MW-2
MW-3
FORMER CHEVRON
O'REILLY AUTO PARTS
BLOCK WALL
BUS STOP
SIDEWALK
DRIVEWAY ENTRANCE
UNIVERSITY DRIVE
MW-6
MW-8
RESTAURANT
CIRCLE K
ALLEY
RESIDENTIAL
HARDY DRIVE
MW-7
5TH STREET
LEGEND:
PROPERTY BOUNDARY
MW-7 GROUNDWATER MONITORING WELL
MW-2 ABANDONED GROUNDWATER MONITORING WELL
RELEASE LUST CASE LOCATION (CASE NOs. 4222.01, 4222.02, 4222.04)
CURRENT BENZENE PLUME EXTENT (DASHED WHERE INFERRED)
ESTIMATED MAXIMUM EXTENT OF BENZENE PLUME
NOTE:
AQUIFER WATER QUALITY STANDARD(AWQS) FOR BENZENE IS 5 µg/L
0
40'
80'
APPROXIMATE SCALE 1 in. = 40 ft.
FORMER CHEVRON NO. 97019
1002 WEST UNIVERSITY DRIVE
TEMPE, ARIZONA
MAXIMUM AND CURRENT
EXTENT OF BENZENE PLUME
ARCADIS
FIGURE
5