ADEQ Arizona Department of Environmental Quality

TECHNICAL SUPPORT DOCUMENT

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

LUST Case File #5050.01-.03
Facility ID #0-007296
Yavapai County

Carioca #61 (Shell Station #12121)
333 Grove Avenue
Prescott, AZ 86301

Background

The subject Site is located east of Grove Avenue and approximately 166 feet north of Sheldon Street in Prescott. The Site is currently an active gasoline station, convenience store, and carwash owned by Carioca Company. The UST system was installed in 1968. Leaking UST #5050.01 was opened in 1999 based on soil and groundwater samples collected. A second release occurred in 2001 and Leaking UST #5050.02 was assigned. Shell Oil Products US (Shell) is the UST owner/operator for these releases. In 2020 a third release was identified by soil sampling during a UST removal and assigned Leaking UST #5050.03. The Carioca Company is the UST owner/operator.

Since the opening of LUST #5050.01 and #5050.02, many site investigative actions have been conducted at the Site by various consultants working for Shell up until GES assumed responsibility in 2015. GES' investigative activities included soil boring/sampling, installation of on-site and off-site groundwater monitoring wells and subsequent regular sampling, and collection and analysis of soil vapor samples.

Removal or Control of the Source of Contamination

Free-product removal from monitoring wells was conducted until 2004 through hand bailing. Free product was last detected in MW-19 on October 2, 2009 as a sheen. It was not detected in MW-19 after that time until during development and groundwater monitoring activities on February 23, 2021. The depth to product was 23.14 feet below ground surface (bgs) with a thickness of approximately 0.40 feet. The free product in MW-19 has not been detected since this date and is likely attributed to the UST closure and excavation activities.

A dual phase extraction (DPE) system operated from May 2011 through May 2014 when it was shutdown to determine further corrective actions after reaching asymptotic groundwater concentrations. Approximately 9,851 pounds of total petroleum hydrocarbons (TPH) and 15.95 pounds of benzene were removed during the operation period.

The UST system was removed and replaced between October and November 2020. EnTech (contractor for Carioca) removed 539 tons of excavated soil during the UST closure assessment from the source area (release 5050.03), and GES removed 250 tons of soil during over-excavation activities from the historic

source area (release 5050.01). At both excavation locations the depths of each was dictated by the presence of bedrock. Following the completed excavation, the UST pit and excavation extension was lined with a Geotextile woven liner. ORC® was spread and mixed with the backfill in the GES over-excavation area and EnTech UST excavation pit. ORC® is an engineered, oxygen release compound designed for enhanced in situ aerobic bioremediation of petroleum hydrocarbons in groundwater and saturated soils.

In February 2021, GES supervised the installation of two soil borings (MW-18, MW-19) in the over excavated area to a depth of 25 feet bgs. Soil data from MW-18 had no VOC detections over laboratory reporting limits. Soil data from MW-19 showed no VOCs were detected above their respective rSRLs, or minimum Groundwater Protection Levels (GPLs).

Characterization of the Groundwater Plume

The Central Highlands Province consists of several aquifer types, including alluvial unconsolidated sedimentary aquifers, as well as fractured bedrock aquifers of igneous and metamorphic rocks. Aquifers can be shallow, with groundwater feeding rivers and streams. The Site lies within the Central Highlands Province, specifically within the Prescott Active Management Area. Specific site subsurface soils generally consist of fill and sandy gravel to depths of 10 feet bgs , decomposing granitic rock at depths between 10 and 15 feet bgs, and granitic bedrock at depths greater than 15 feet bgs. The lithology of the aquifer material beneath appears to be sandy gravel and decomposing granitic bedrock that is thought to be only two (2) to four (4) feet thick.

A review of the ADEQ files identified the Arizona Public Service (APS) has a yard located east and southeast of the subject property with groundwater monitoring wells indicating flow directions to the southeast (generally following the Miller Creek drainage). The APS report suggested groundwater flow conditions appear to be influenced with surface flow of Miller Creek.

Based on groundwater samples collected during initial site characterization activities, groundwater was impacted by benzene, toluene, ethylbenzene and xylenes (BTEX) and methyl tert-butyl ether (MTBE) at concentrations above the ADEQ Aquifer Water Quality Standards (AWQS), or Tier 1 Corrective Action Standard, respectively.

Down-gradient offsite wells MW-13, MW-14, and VAPS-1 have remained below AWQS since 2015. Cross-gradient offsite wells MW-16 and MW-17 have remained non-detect since their original installation in October 2016. The adjacent property owner did not give site access for a well- so the APS wells were used for plume characterization.

Monitoring wells MW-18, and MW-19 are adjacent to the UST pit and the original source area of LUST #5050.01, have been below ADEQ AWQS for at least two rounds of groundwater monitoring.

Groundwater benzene concentrations continue to exceed the AWQS in MW-11, MW-12, MW-20, and MW-22. These wells represent the area just east/southeast of the station canopy (LUST #5050.03) and east of the current UST pit (#5050.01).

Depth-to-water (DTW) measurements were collected by GES on September 6-7, 2022 from groundwater monitoring wells MW-1, MW-2, MW-4, MW-5, MW-6, MW-7, MW-11, MW-12, MW-13, MW-14, MW-16, MW-17, MW-18, and MW-19. EnTech collected DTW measurements from MW-20, MW-21, and MW-22 on September 6, 2022. The DTW measurements collected on September 6-7, 2022 were used to calculate the general groundwater flow direction and gradient at the Site. The groundwater flows to the north/northwest with a hydraulic gradient of 0.09 feet/foot and northeast with a hydraulic gradient of 0.03 feet/foot, which is consistent with historical data. Depth to groundwater ranged from 2.41 feet below top of casing (btoc) in MW-13 to 10.18 feet btoc in MW-14. In general, when compared to the June 2022 groundwater monitoring event, groundwater elevations increased an average of 1.58 feet across all monitoring wells.

Groundwater samples were collected by GES on September 6-7, 2022 and submitted for volatile organic compound (VOC) analysis. EnTech purged and sampled monitoring wells MW-20, MW-21, and MW-22 in association with LUST #5050.03 on September 6, 2022. Groundwater analytical results were shared between GES and EnTech. Benzene concentrations in MW-11 (36.6 micrograms per liter (µg/L)), MW-12 (36.8 µg/L), MW-20 (7.74 µg/L), and MW-22 (16.0 µg/L) exceeded the ADEQ Aquifer Water Quality Standard (AWQS) of 5.0 µg/L. All other analytes were either detected below their respective AWQS, do not have an established AWQS, or were not detected above a laboratory detection limit.

Groundwater Plume Stability

Groundwater monitoring has been conducted quarterly from 2005 to 2022 where groundwater has ranged from approximately one (1) to 23 feet bgs since 1999 with an average depth of 6.96 feet bgs. GES conducted a trend analysis of benzene concentrations in MW-1, MW-2, MW-6, MW-11, MW-12, MW-18, MW-19, MW-20, MW-21, and MW-22 using the GSI Mann-Kendall Toolkit for Constituent Trend Analysis.

Results of the analysis indicate that benzene concentrations exhibit a “decreasing” trend in MW-1, MW-2, MW-19, and MW-22 and a “probably decreasing” trend in MW-21. The “no trend” exhibited in MW-6 and MW-18 is likely due to recent results being below the laboratory detection limit and the “no trend” exhibited in MW-20 is likely due to the shorter sampling history and fluctuating benzene concentrations. Benzene concentrations exhibited an “increasing” trend in both MW-11 and MW-12. It should be noted that the logarithmic nature of the Mann-Kendall analysis requires all inputs be at or above a unit equal to or greater than one to achieve an accurate trend. The overall output concentration trends suggest long-term stability of the groundwater plume.

Based on soil conditions logged below the site and variable depths to water encountered in several borings, the perched groundwater is discontinuous (i.e., groundwater occurs within more permeable lenses and layers within a discrete range of depths above the regional aquifer; however, those layers/lenses are not necessarily connected to each other). Groundwater levels in MW-1S generally fell 0.25 feet between June and December 2022.

The shrinking contamination plume appears to be localized in the asphalt lot east of the source area around MW-11 and MW-12 (LUST #5050.01) and east/southeast of the station canopy around MW-20, MW-21, and MW-22 (LUST #5050.03).

GES utilized a Groundwater Spatiotemporal Data Analysis Tool (GWSDAT) excel plugin to further analyze COC concentration trends in the dissolved phase at the Site. Benzene, toluene, ethylbenzene, total xylenes, and MTBE concentration data from June 1999 to September 2022 was entered into GWSDAT. Based on the GWSDAT output, it appears that the bulk of the contaminant was removed after the UST removal and over-excavation in 2021. The mass around the source area in the southern part of the site depicts an overall shrinking plume of BTEX and MTBE since 2006.

Natural Attenuation

Natural attenuation is general term to account for numerous naturally occurring processes that impede contaminant migration and reduce concentrations. For petroleum hydrocarbons, these processes generally include diffusion, dispersion, sorption, volatilization, and biodegradation. The primary line of evidence for natural attenuation is decreasing contaminant trends. As discussed in previous sections, a decreasing trend of COC concentrations in groundwater has been well established based on 23 years of site groundwater monitoring data, thereby supporting the primary line of evidence for natural attenuation.

The second line of evidence is hydrogeologic and geochemical data that can be used to demonstrate indirectly the type(s) of natural attenuation processes active at the site. Many of the most environmentally significant components of petroleum hydrocarbons, such as BTEX, can biodegrade under proper environmental conditions. Monitored Natural Attenuation (MNA) parameters were collected during the March 2022 monitoring event from a clean upgradient well (MW-4), a source well (MW-18), and clean downgradient wells (MW-1, MW-6, and MW-16). Some MNA parameters, such as dissolved oxygen (DO) and oxidation reduction potential (ORP) were collected in the field using a water quality meter; additional MNA parameters were analyzed by a laboratory and included nitrates, sulfates, manganese, and ferrous iron.

The results from the MNA study suggests that biodegradation is occurring. The main mechanism for natural attenuation appears to be aerobic degradation, which is supported by the relatively high DO concentrations in each of the upgradient wells along with a decrease in DO in the source and downgradient well (with the exception of MW-6, as it was collected from a disposable bailer where DO data might be skewed) when compared to the upgradient well. Additionally, ORP values are higher in the upgradient well than in the source and downgradient well. The results from the remaining parameters tested for are less conclusive, as they were all relatively low or non-detect, though with a general trend of being lower in the upgradient well than in the source and downgradient wells.

GES performed a BIOSCREEN to simulate remediation through natural attenuation of dissolved petroleum hydrocarbons, specifically benzene. Results of these assessments indicate that the majority of the dissolved impacts observed in the vicinity of MW-19 and MW-20 are degrading at a rate that prevents impacts above an AWQS from extending beyond the most down gradient wells, MW-13 and MW-16.

Other Exposure Pathways

In 2018, to evaluate the exposure pathway of indoor inhalation of COCs, GES utilized the online version of the Johnson & Ettinger (J&E) model to evaluate soil vapor data. Consistent with A.A.C. R18-7-205 and 206, risk factors for COCs designated as human carcinogens and known carcinogens were compared to a residential standard of 10-6. Hazard quotients for all of the COCs were compared to a residential standard of one. The results of the vapor risk assessment for individual and cumulative effects indicated an acceptable amount of risk for the vapor intrusion exposure pathway.

For the 2021 EnTech soil vapor survey, the vapor sample results were further evaluated using the J&E Model. Risk factors for COCs designated as human carcinogens and known carcinogens were compared to a residential standard of 10-6. Hazard quotients for all of the COCs were compared to a residential standard of one. The results of the vapor risk assessment for individual and cumulative effects indicated an acceptable amount of risk for the vapor intrusion exposure pathway.

The groundwater well (MW-12) near the property boundary was also evaluated for potential vapor intrusion risk to the off-site building, if the groundwater contamination is located beneath that building, as a conservative measure. The cancer risk and non-cancer risk were 10-7, and below 1, respectively, which demonstrates acceptable risk.

The Site is situated near Butte Creek, an intermittent stream located approximately 400 feet northeast of the site which flows into Miller Creek, an intermittent stream located east and northeast of the site which flows east into Granite Creek. Butte and Miller Creeks (both intermittent) are located approximately 400 feet to the northeast and 1,500 feet to the east, respectively, of the Site. These sensitive receptors are unimpacted and were delineated by the off-site APS well network VAPS-1, VAPS-2, and APS MW-1, APS MW-5, APS MW-6, and APS MW-7.

The surrounding area includes commercial, industrial, and residential properties within ¼ mile. There is no off-site soil contamination, so there are no impacts to nearby properties. Potable water is provided by the City of Prescott.

Threatened or Impacted Drinking Water Wells

Ground water is the sole source of potable water in the City of Prescott. The City produces water from eight production wells from the Prescott AMA (Active Management Area) and Airport area. The water is disinfected through a chlorine treatment process and then pumped into a five-million-gallon reservoir at the Chino Production Facility. From that location, booster pumps convey the water to Prescott via high-pressure water mains. The water flows through these distribution mains into storage facilities throughout the City.

GES conducted a well survey on August 8, 2022 using information available on the Arizona Department of Water Resources (ADWR) website for water wells within a ¼-mile radius of the Site. The database identified 63 wells within the search radius. Of these wells, 9 are identified as “Exempt”, Of the “Exempt” wells, two are located down-gradient of the Site. These two wells were installed in the 1980’s for domestic and garden use, ranging from 15 to 100 feet bgs. Well #55-800114 is located approximately 700 feet down-gradient to the northeast just beyond Butte Creek. Well #55-639752 is located in the same

general neighborhood toward the northeast (an address or exact location was not provided). All other "Exempt" wells were identified cross or up-gradient of the Site.

Requirements of A.R.S. §49-1005(D) and (E):
The results of the groundwater data from the site assure protection of public health, welfare and the environment, to the extent practicable, and 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.

Groundwater data tables:
AWQS – Aquifer Water Quality Standard

Well ID	Date Sampled	Depth to water (feet)	Benzene AWQS is 5 µg/L
MW-11 Screen: 3-25 ft. Depth: 25 ft.	2/19/2009	5.35	**47.0**
	10/22/2009	8.21	**1,710**
	12/15/2010	7.48	**114**
	5/2011-3/2014 DPE	--	---
	8/14/2014	7.42	4.00
	12/08/2015	7.65	3.30
	06/06/2016	6.55	2.30
	12/20/2017	7.02	**9.20**
	09/06/2018	5.78	0.97
	12/16/2019	5.38	**36.3**
	11/2020 UST removal	---	**---**
	12/08/2020	6.82	**27.7**
	09/27/2021	5.71	**34.3**
	12/20/2021	6.06	**15.5**
	03/29/2022	5.67	**33.2**
	06/08/2022	6.63	**91.9**
	09/06/2022	5.38	**36.6**

Well ID	Date Sampled	Depth to water (feet)	Benzene AWQS is 5 µg/L
MW-12 Screen: 3-23 ft. Depth: 23 ft.	2/19/2009	5.85	**330**
	10/22/2009	8.94	3.51
	12/15/2010	7.81	**16.3**
	5/2011-3/2014 DPE	--	---
	8/14/2014	7.94	<1.0
	12/08/2015	7.14	<1.0
	06/06/2016	7.08	<1.0
	12/20/2017	8.51	0.60
	09/06/2018	6.25	**6.40**
	12/16/2019	5.99	1.01
	11/2020 UST removal	---	**---**
	12/08/2020	8.92	<1.00
	09/27/2021	6.26	**17.6**
	12/20/2021	6.62	3.88
	03/29/2022	5.27	**6.74**
	06/08/2022	7.25	**31.8**
	09/06/2022	5.96	**36.8**

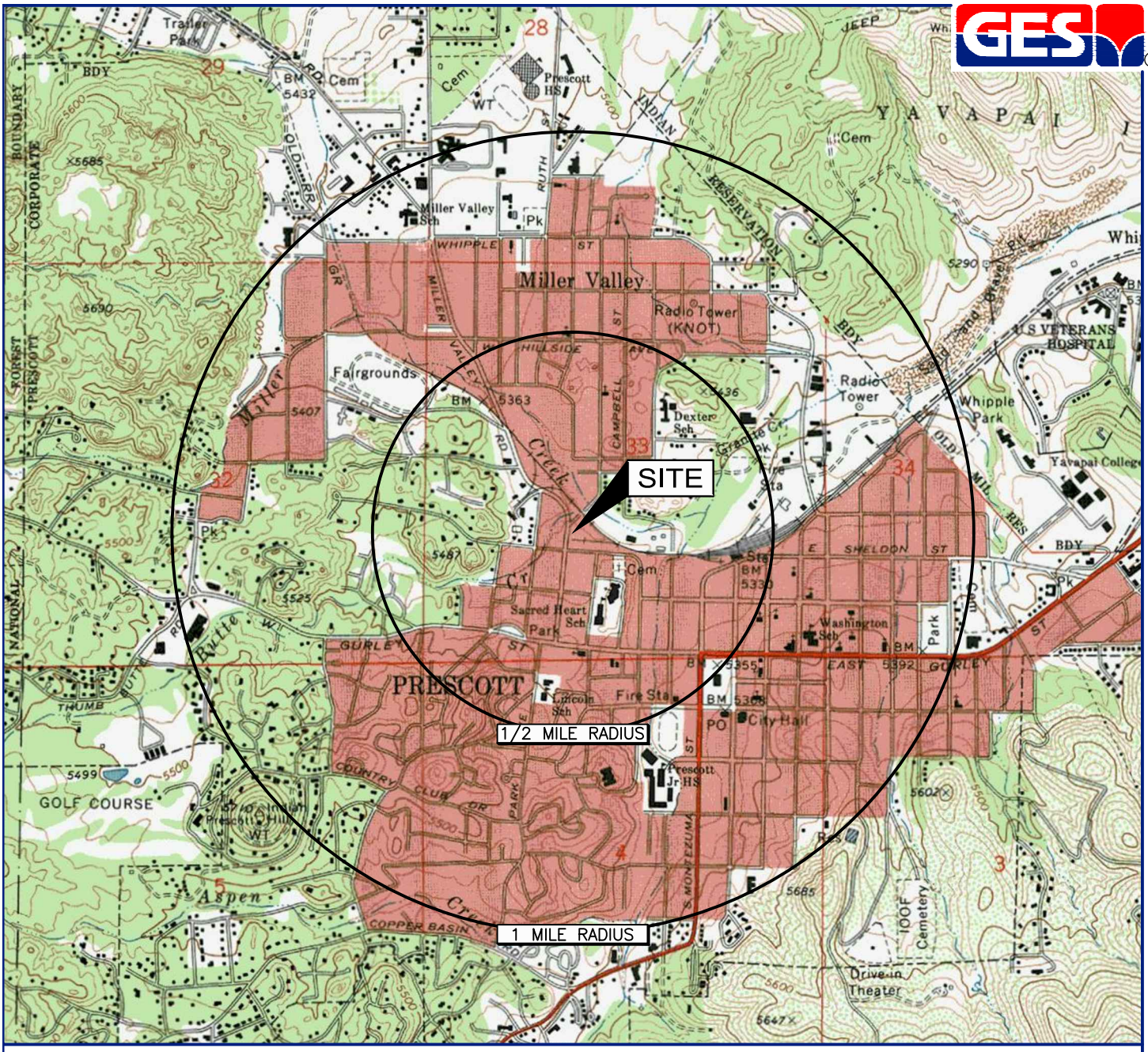
Well ID	Date Sampled	Depth to water (feet)	Benzene AWQS is 5 µg/L
MW-18 Screen: 3-25 ft. Depth: 25 ft.	02/23/2021	8.20	**9.82**
	06/03/2021	6.97	**8.31**
	09/28/2021	5.91	<1.00
	12/20/2021	6.81	0.452
	03/29/2022	6.35	0.490
	06/08/2022	7.04	0.284
	09/06/2022	5.75	2.17

Well ID	Date Sampled	Depth to water (feet)	Benzene AWQS is 5 µg/L
MW-19 Screen: 3-25 ft. Depth: 25 ft.	02/23/2021	22.97	**2,240**
	06/03/2021	6.32	**119**
	09/28/2021	5.27	0.452
	12/20/2021	6.17	**13.5**
	03/29/2022	5.70	**9.55**
	06/08/2022	6.40	2.55
	09/06/2022	5.11	<1.00

Well ID	Date Sampled	Depth to water (feet)	Benzene AWQS is 5 µg/L
MW-20 Screen: 3-23 ft. Depth: 23 ft.	09/27/2021	5.51	2.55
	1/13/2022	5.02	**151**
	03/23/2022	5.48	**453**
	06/08/2022	6.67	**65.9**
	09/06/2022	5.52	**7.74**

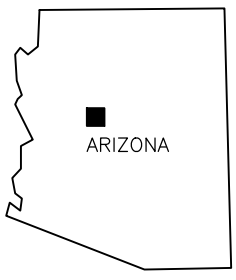
Well ID	Date Sampled	Depth to water (feet)	Benzene AWQS is 5 µg/L
MW-21 Screen: 3-23 ft. Depth: 23 ft.	09/27/2021	4.63	**7.11**
	1/13/2022	3.81	3.13
	03/23/2022	4.25	2.45
	06/08/2022	4.14	3.53
	09/06/2022	3.96	3.11

Well ID	Date Sampled	Depth to water (feet)	Benzene AWQS is 5 µg/L
MW-22 Screen: 3-23 ft. Depth: 23 ft.	09/27/2021	3.17	**118**
	1/13/2022	3.06	**45.9**
	03/23/2022	3.37	**29.5**
	06/08/2022	4.93	**7.64**
	09/06/2022	3.10	**16.0**



SOURCE: USGS 7.5 MINUTE SERIES
TOPOGRAPHIC QUADRANGLE 1973
PRESCOTT, ARIZONA
CONTOUR INTERVAL = 20'

TOWNSHIP – 14N
RANGE – 2W
SECTION – 33



QUADRANGLE LOCATION

DRAFTED BY: E.V. (N.J.)	SITE LOCATION MAP
CHECKED BY: M.K.	SHELL OIL PRODUCTS US SHELL STATION #121121 333 GROVE AVENUE PRESCOTT, ARIZONA
REVIEWED BY: B.B.	Groundwater & Environmental Services, Inc. 4640 East Elwood Steet, Suite 5, Phoenix, AZ
NORTH	SCALE IN FEET: 0 – 2000 / DATE: 4–1–15 / FIGURE: 1

LEGEND

- PROPERTY BOUNDARY
- DISPENSER ISLAND
- UNDERGROUND STORAGE TANK
- DPES — DUAL PHASE EXTRACTION SYSTEM
- EXISTING GROUNDWATER MONITORING WELLS
- ABANDONED GROUNDWATER MONITORING WELLS
- OFFSITE ARIZONA PUBLIC SERVICE GROUNDWATER MONITORING WELL
- DUAL PHASE EXTRACTION WELL
- ABANDONED DUAL PHASE EXTRACTION WELL
- OFFSITE CITY OF PRESCOTT GROUNDWATER MONITORING WELL
- APPROXIMATE GROUNDWATER GRADIENT
- LINE OF EQUAL GROUNDWATER ELEVATION; DASHED WHERE INFERRED (FEET ABOVE MEAN SEA LEVEL)
- 5334.58 — GROUNDWATER ELEVATION IN FEET (FEET ABOVE MEAN SEA LEVEL)

LINCOLN AVENUE

GROVE AVENUE

VCOP2 (destroyed)

MW-14 5326.76

VCOP1 (destroyed)

MW-16 5325.43

MW-13 5334.64

MW-2 5332.92

MW-7 5337.83

MW-22 5337.50

MW-1 5334.58

MW-17 5330.74

MW-21 5337.14

MW-20 5335.91

MW-6 5334.71

MW-12 5335.09

MW-8

MW-3

MW-19

MW-10

MW-11 5335.48

MW-9

MW-15

MW-18 5336.30

MW-4 5339.04

MW-5 5335.60

VAPS-2

VAPS-1

APS MW-7

APS MW-5

APS MW-1

APS MW-6

5,326.0

5,327.0

5,328.0

5,329.0

5,330.0

5,331.0

5,332.0

5,333.0

5,334.0

5,335.0

5,336.0

5,337.0

5,338.0

LUST #505(.02

LUST #505(.03

LUST #5050.01

AUTO REPAIR SHOP

SHOP

CONVENIENCE PLUS STORE

CANOPY

OVERHANG

12K GALLON UNLEADED & 4K GALLON PREMIUM (16K TOTAL COMPARTMENTAL UST)

FORMER USTs

CAR WASH

SIGN

GATE

CHAIN-LINK FENCE

ELECTRICAL POLE

WROUGHT IRON FENCE

ARIZONA PUBLIC SERVICE

PARKING LOT

BUILDING

M:\Graphics\3200-Phoenix\Shell\Arizona\121121 Prescott\121121 Prescott SM.dwg, B-60, EVega

Groundwater Contour Map
September 6 - 7, 2022

Shell Oil Products US
Shell Station #121121
333 Grove Avenue
Prescott, Arizona

Drawn E.V.
Designed M.K.
Approved B.B.
Date 09/14/22
Figure 5

Scale In Feet (Approximate)
0 60

Groundwater & Environmental Services, Inc.

LEGEND

- PROPERTY BOUNDARY
- DISPENSER ISLAND
- UNDERGROUND STORAGE TANK
- DPES — DUAL PHASE EXTRACTION SYSTEM
- EXISTING GROUNDWATER MONITORING WELLS
- ABANDONED GROUNDWATER MONITORING WELLS
- OFFSITE ARIZONA PUBLIC SERVICE GROUNDWATER MONITORING WELL
- DUAL PHASE EXTRACTION WELL
- ABANDONED DUAL PHASE EXTRACTION WELL
- OFFSITE CITY OF PRESCOTT GROUNDWATER MONITORING WELL

MW-1	WELL IDENTIFICATION
B 0.268 E4	BENZENE CONCENTRATION (µg/L)
T 1.74	TOLUENE CONCENTRATION (µg/L)
E 20.4	ETHYLBENZENE CONCENTRATION (µg/L)
X 132	XYLENES CONCENTRATION (µg/L)
MTBE <1.00	MTBE CONCENTRATION (µg/L)

- µg/L — MICROGRAMS PER LITER
- fmsl — FEET ABOVE MEAN SEA LEVEL
- E4 — CONCENTRATION ESTIMATED
- MTBE — METHYL *tert*–BUTYL ETHER
- <# — WHERE AN ANALYTE IS NOT DETECTED A METHOD REPORTING LIMIT IS GIVEN
- **BOLD** — ANALYTE WAS PRESENT AT A CONCENTRATION GREATER THAN THE ADEQ AWQS

MW-16	
B	<1.00
T	1.16
E	<1.00
X	<3.00
MTBE	<1.00

MW-14	
B	<1.00
T	<1.00
E	<1.00
X	<3.00
MTBE	<1.00

MW-17	
B	<1.00
T	<1.00
E	<1.00
X	<3.00
MTBE	<1.00

MW-2	
B	<1.00
T	<1.00
E	<1.00
X	<3.00
MTBE	<1.00

MW-22	
B	**16.0**
T	4.57 E4
E	80.6
X	168
MTBE	<5.00

MW-7	
B	<1.00
T	<1.00
E	<1.00
X	<3.00
MTBE	<1.00

MW-1	
B	<1.00
T	1.74
E	20.4
X	132
MTBE	<1.00

MW-13	
B	<1.00
T	<1.00
E	<1.00
X	<3.00
MTBE	<1.00

MW-6	
B	2.84
T	<1.00
E	<1.00
X	0.626 E4
MTBE	53.9

MW-12	
B	**36.8**
T	2.80
E	8.22
X	59.3
MTBE	14.8

MW-20	
B	**7.74**
T	16.6
E	11.2
X	210
MTBE	<1.00

MW-21	
B	3.11 E4
T	5.19
E	125
X	79.5
MTBE	<5.00

MW-4	
B	<1.00
T	<1.00
E	<1.00
X	<3.00
MTBE	<1.00

MW-19	
B	<1.00
T	<1.00
E	0.492 E4
X	0.42 E4
MTBE	0.40 E4

MW-18	
B	2.17
T	<1.00
E	<1.00
X	<3.00
MTBE	<1.00

MW-5	
B	<1.00
T	<1.00
E	<1.00
X	<3.00
MTBE	<1.00

MW-11	
B	**36.6**
T	0.48 E4
E	1.17
X	1.54 E4
MTBE	18.5

LINCOLN AVENUE
GROVE AVE
VCOP2 (destroyed)
VCOP1 (destroyed)
MW-16
MW-14
MW-13
MW-17
MW-2
MW-22
MW-7
MW-1
MW-6
MW-12
MW-20
MW-21
MW-8
MW-3
MW-19
MW-10
MW-11
MW-9
MW-15
MW-18
MW-4
MW-5
LUST #5050.02
LUST #5050.03
LUST #5050.01
12K GALLON UNLEADED & 4K GALLON PREMIUM (16K TOTAL COMPARTMENTAL UST)
FORMER USTs
CHAIN-LINK FENCE
GATE
SIGN
CANOPY
BUILDING OVERHANG
CONVENIENCE PLUS STORE
AUTO REPAIR SHOP
CAR WASH
SHOP
PARKING LOT
ELECTR POLE
BUILDING
VAPS-2
VAPS-1
APS MW-7
APS MW-5
APS MW-1
APS MW-6
ARIZONA PUBLIC SERVICE

Groundwater Analytical Data Map
September 6 - 7, 2022

Shell Oil Products US
Shell Station #121121
333 Grove Avenue
Prescott, Arizona

Drawn E.V.
Designed M.K.
Approved B.B.
Date 10/06/22
Figure 6

Scale In Feet (Approximate)
0 60

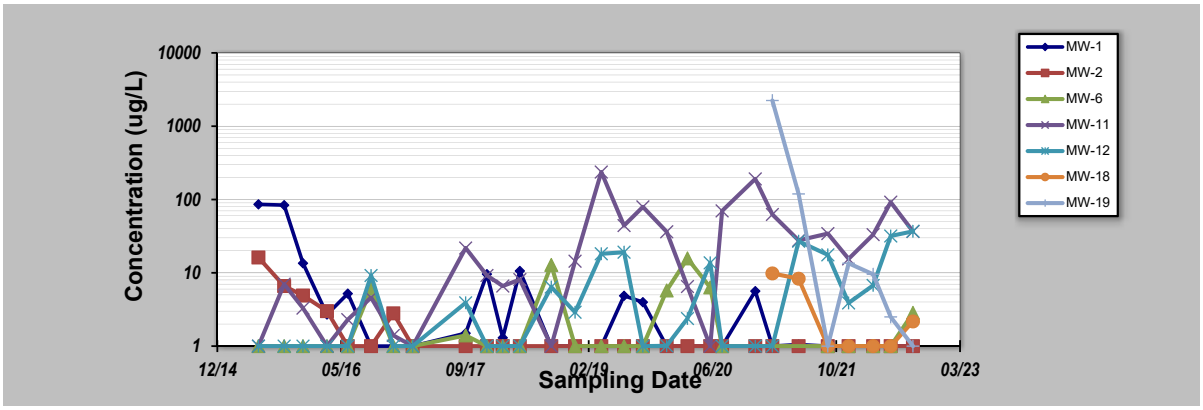
Groundwater & Environmental Services, Inc.

M:\Graphics\3200-Phoenix\Shell\Arizona\121121 Prescott\121121 Prescott SM.dwg, B-60, EVega

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

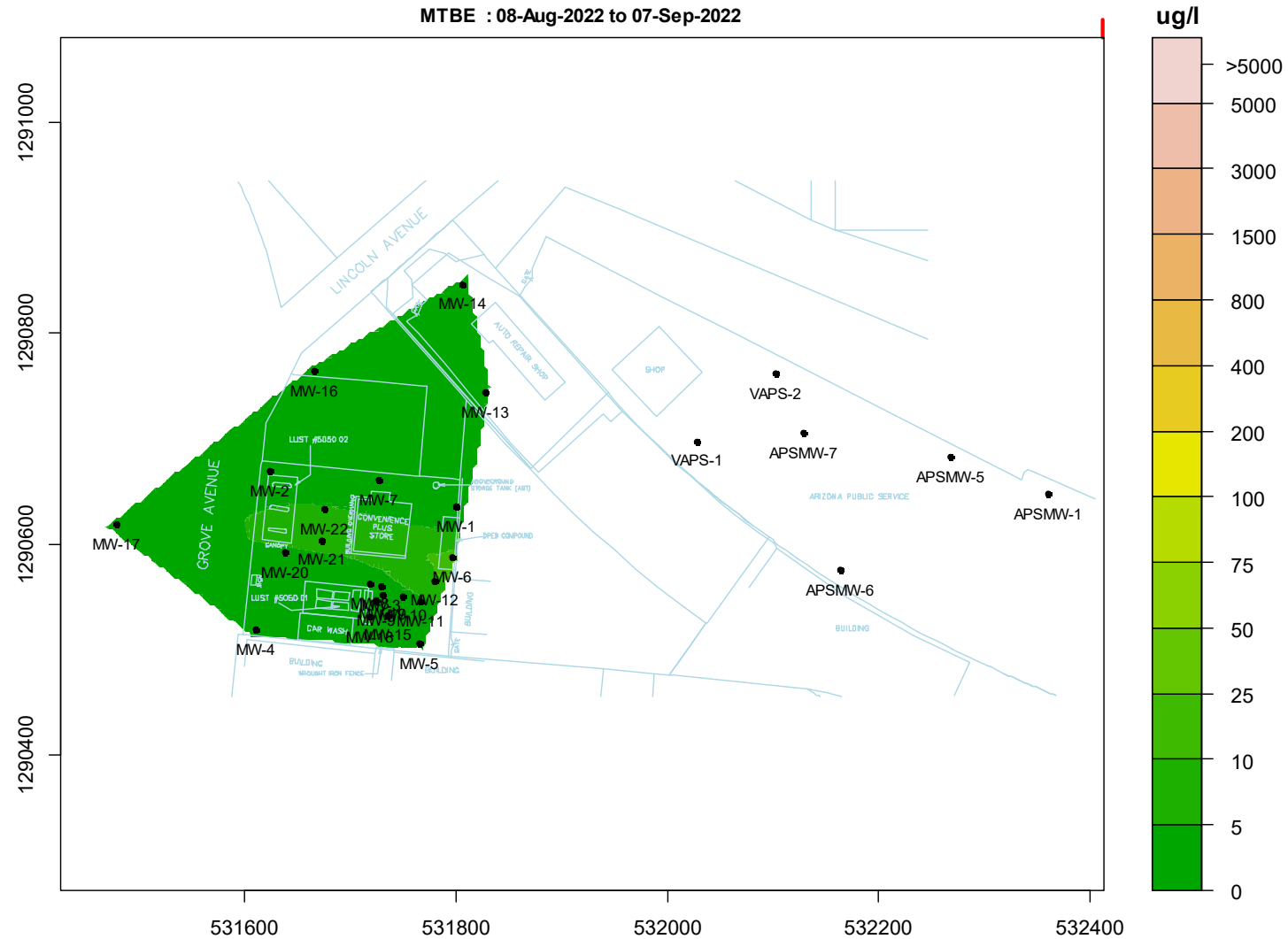
Evaluation Date:	5-Oct-22	Job ID:	3616012
Facility Name:	Shell Prescott	Constituent:	Benzene
Conducted By:	Anya Kadlubowski	Concentration Units:	ug/L

Sampling Point ID:	MW-1	MW-2	MW-6	MW-11	MW-12	MW-18	MW-19
Sampling Event	Sampling Date	BENZENE CONCENTRATION (ug/L)						
1	11-Jun-15	85.9	16.2	1	1	1		
2	23-Sep-15	83.8	6.6	1	7	1		
3	8-Dec-15	13.5	4.9	1	3.3	1		
4	14-Mar-16	2.7	3	1	1	1		
5	6-Jun-16	5.2	1	1	2.3	1		
6	8-Sep-16	1	1	6.1	4.6	9.2		
7	7-Dec-16	1	2.8	1	1.4	1		
8	23-Feb-17	1	1	1	1	1		
9	25-Sep-17	1.5	1	1.4	21.8	3.9		
10	20-Dec-17	9.6	1	1	9.2	1		
11	22-Feb-18	1.3	1	1	6.6	1		
12	2-May-18	10.6	1	1	8.1	1		
13	6-Sep-18	1	1	12.8	1	6.4		
14	11-Dec-18		1	1	14.4	2.9		
15	27-Mar-19	1	1	1	237	18.2		
16	27-Jun-19	4.86	1	1	44.1	19.1		
17	11-Sep-19	3.98	1	1	79.3	1		
18	16-Dec-19	1	1	5.74	36.3	1.01		
19	9-Mar-20	1	1	15.7	6.5	2.38		
20	9-Jun-20	1	1	6.32	1	13.7		
21	27-Jul-20	1	1	1	70	1		
22	8-Dec-20	5.63	1		191	1		
23	15-Feb-21	1	1		62.5	1	9.82	2240
24	1-Jun-21	1.05	1		27.7	27	8.31	119
25	27-Sep-21	1	1	1	34.3	17.6	1	1
26	20-Dec-21	1	1	1	15.5	3.88	1	13.5
27	29-Mar-22	1	1	1	33.2	6.74	1	9.55
28	8-Jun-22	1	1	1	91.9	31.8	1	2.5
29	6-Sep-22	1	1	2.84	36.6	36.8	2.17	1
30								
Coefficient of Variation:		2.49	1.53	1.41	1.54	1.38	1.11	2.46
Mann-Kendall Statistic (S):		-149	-126	34	178	161	-7	-14
Confidence Factor:		99.9%	99.1%	76.5%	>99.9%	99.9%	80.9%	97.5%
Concentration Trend:		Decreasing	Decreasing	No Trend	Increasing	Increasing	No Trend	Decreasing

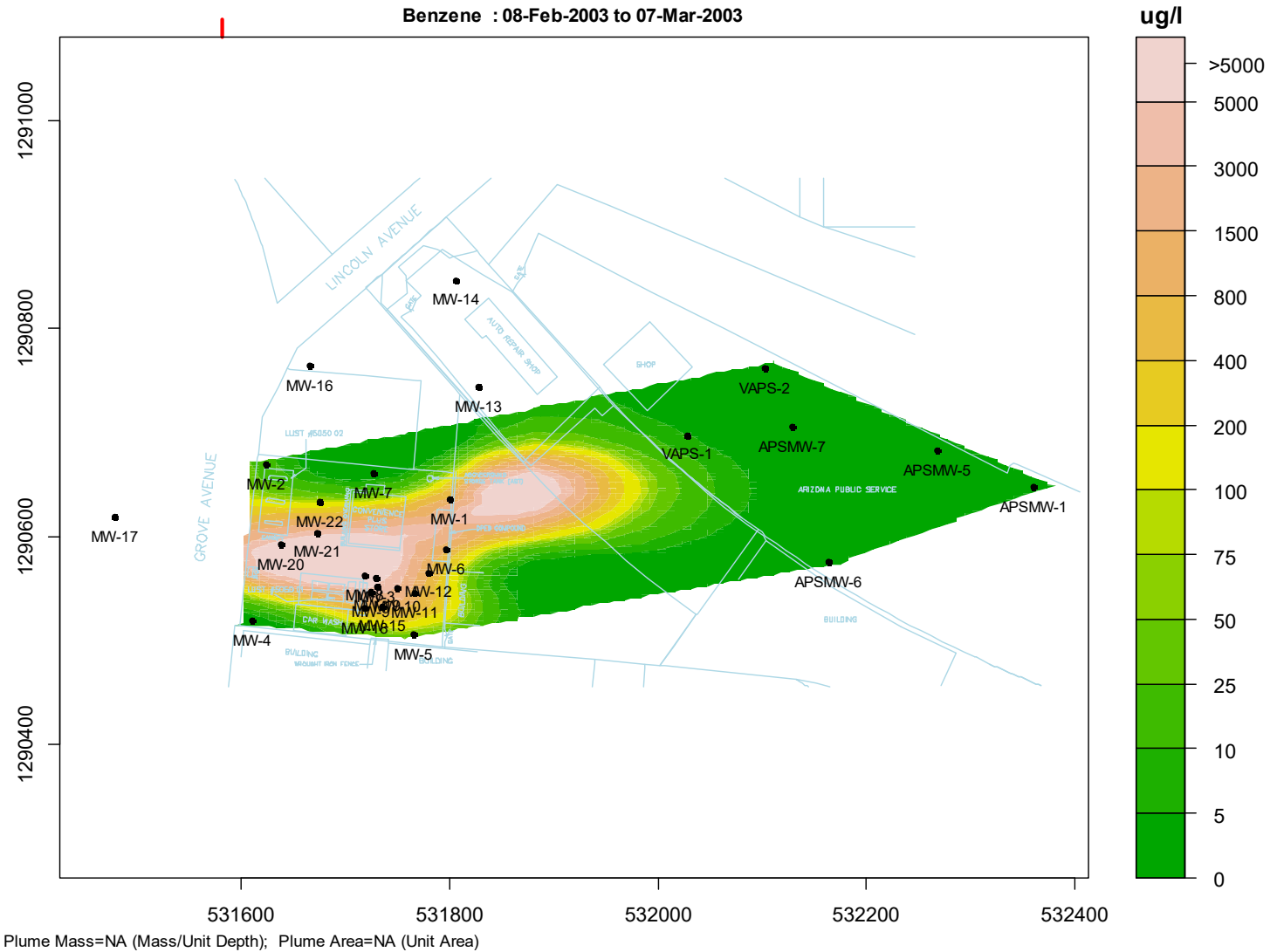


Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

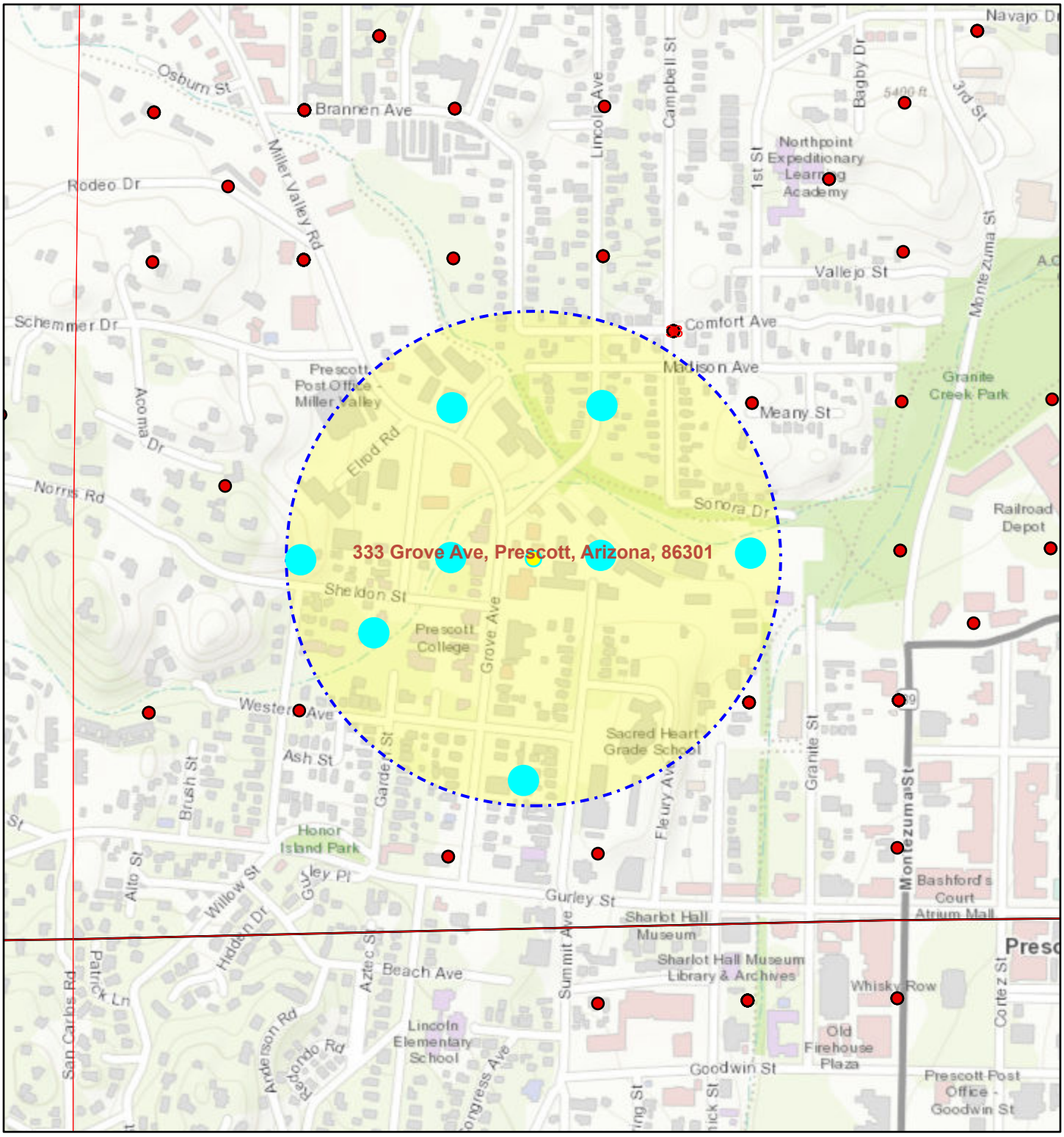


Plume Mass=NA (Mass/Unit Depth); Plume Area=NA (Unit Area)



Plume Mass=NA (Mass/Unit Depth); Plume Area=NA (Unit Area)

Sensitive Receptor Survey - 1/4 Mile



Well_Registry

Section

Township

County

1:9,028

0 0.05 0.1 0.2 mi

0 0.1 0.2 0.4 km

Coconino County, County of Yavapai, Bureau of Land Management, Esri, HERE, Garmin, GeoTechnologies, Inc., Intermap, USGS, METI/NASA, EPA, USDA

Arizona Department of Water Resources