ADEQ Arizona Department of Environmental Quality

TECHNICAL SUPPORT DOCUMENT

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

LUST Case File #3169.01-.04 **former Ray Bell Oil #416**
Facility ID # 0-006448 **320 South Arizona Boulevard**
Pinal County **Coolidge, Arizona 85128**

Background:
The local area around the Former Ray Bell Oil #416 is a mixture of commercial and residential property along Arizona Boulevard in Coolidge, Arizona. The property is privately owned and was acquired from Ray Bell Oil Company in 2004. The last known development of the property was a retail fuel dispensing business operated by Ray Bell Oil Company. The fuel facilities and all of the above ground structures have been removed. In addition to the former underground fuel storage tanks, concrete foundations indicate that there was once a building near the center of the property and three fuel dispenser islands along the east edge of the property that is adjacent to Arizona Boulevard. Currently, 70% of the parcel is fenced with a single access gate near the northwest corner.

Three underground storage tanks (USTs) were reportedly installed in 1974 and were removed in November 1993. Soil data confirmed two LUST releases (3169 .01 and 3169 .02) occurred from the USTs, and two releases (3169 .03 and 3169 .04) were assigned to north-south and east-west piping runs. However, the leaking UST (LUST) numbers were not assigned by ADEQ until 1999.

Between 1994 and 1996, ten groundwater wells were installed to characterize the extent of petroleum contamination from LUST releases .01 and .02. In 1996-1997, eight of the wells were abandoned due to the unexpected rise in groundwater elevation, which submerged the well screens. Replacement groundwater wells (MW-#R) were installed and monitored but most wells were dry by 2008.

In 2010, soil sampling and groundwater well installation was conducted for the UST owner/operator by Environmental Technology, Inc. (EnTech) to evaluate LUST releases .03 and .04. ADEQ approved the *Site Characterization Report* on December 22, 2010, and also requested a *Corrective Action Plan* (CAP). The CAP was approved in 2014.

Removal or control of the source of contamination:
A UST system was excavated and removed from the Site in November 1993. From 2011-2012, soil vapor extraction and air sparge (SVE/AS) remediation was conducted by EnTech and Zelen. The SVE was discontinued in August 2016 due to very low volatile organic compound (VOCs) concentrations in the extracted vapor. On May 4, 2017 air sparging was discontinued entirely as a result of the apparent ineffectiveness of the system due to falling groundwater levels.

In-situ chemical oxidation (ISCO) injections of PersulfOx™ into the groundwater occurred between May 2017 and November 2019 to address LUST release .02 (MW-12). MW-2 and air

sparge well AS-1 were used to inject the PersulfOx™ into the groundwater near MW-12 for the May and June 2017 events. On June 1, 2017, an investigative groundwater sample was collected from monitor well MW-12 and analyzed for VOCs. The analytical results were compared to the analytical results for the sample collected from this well on May 4, 2017 prior to the initial PersulfOx™ application, and showed an 84 percent drop in the benzene concentration, a 53 percent drop in the 1, 2-dichloroethane (1,2-DCA) concentration, and a 70 percent drop in the MTBE concentration.

Characterization of the groundwater plume:
Historic groundwater level measurements in monitor wells associated with the site have been collected since August 1997. Measurements near releases 3169.01 and 3169.02 show that the groundwater elevation fell more than 26 feet from December 1997 to September 2018, then rose four feet by March 2019, and fell 3.5 feet by June 2019. Since 2010, groundwater elevations have been higher in November and February and lower in May and August. This pattern superimposes on the general downward trend in groundwater elevation. The subsurface soil lithology logged by EnTech in 2010 show the dominant soil lithologies are sand and silt. Some clay was logged, but it appears to be discontinuous, except for a lens of sandy clay near 75 feet below ground surface (bgs) in the area between releases 3169.01 and 3169.02.

Petroleum hydrocarbons from the releases migrated downward and laterally through the sediments to the level of the groundwater. Lateral migration was likely increased by the caliche layers. The depth to groundwater was more than 70 feet below ground surface (bgs) at the time the releases were discovered in 1993. It rose to about 65 feet bgs in 1997, but declined since then to a low of 92 feet bgs in September 2018 and June 2019. Liquid hydrocarbons floated on and became partially dissolved in the groundwater. The northwest trending groundwater gradient (0.0010 feet per foot) carried dissolved hydrocarbons under Wilson Avenue to the north, and groundwater level fluctuations created a 20-foot vertical smear zone. The current groundwater level is at the bottom of the smear zone.

As a result of declining water levels and SVE and AS remediation, VOC concentrations in groundwater in the monitor wells have been reduced to less than laboratory reporting levels in most wells. In addition, analytical results for groundwater samples collected in monitor well MW-24, located near release 3169.01, show the benzene and MTBE concentrations have been less than Aquifer Water Quality Standards (AWQS) and Tier 1 Corrective Action Standards, respectively since August 2012. 1,2-DCA results for groundwater samples collected in monitor well MW-24 have been less than AWQS since August 2017. However, results for groundwater samples collected in monitor well MW-12 at release 3169.02 show historic concentrations of benzene, 1,2-DCA, and MTBE to be greater than applicable regulatory standards.

The subsurface was last treated with PersulfOx™ on November 25, 2019 at MW-12, and groundwater conditions were monitored on January 28, 2020, and April 28, 2020. Six monitor wells (MW-12, MW-14, MW-15, MW-20, MW-24, and MW-25) were compliance sampled. The groundwater elevation decreased a little more than one foot from January 2020 to April 2020, as it always has at this time of the year. In the groundwater samples collected on April 28, 2020, the only concentrations of VOCs greater than AWQS were under release 3169.02 in

monitor well MW-12. VOC concentrations have been less than the limit of detection in the down gradient monitor well (MW-15) since installation in 2010, and in the cross gradient monitor well (MW-14) since August 2013. Off-site perimeter groundwater wells (MW-13, MW-19, MW-20, MW-21, MW-22, and MW-23) have never had VOC contamination reported over laboratory reporting limits since their installation in 2010.

ADEQ requested additional groundwater monitoring events to monitor the effectiveness of ISCO treatments in MW-12. Zelen collected compliance groundwater samples in October 2020, and again on January 21, 2021. In January 2021, seven monitor wells (MW-12, MW-14, MW-16, MW-17, MW-18, MW-24, and MW-25) were sampled.

The groundwater elevation increased about 1.5 feet from October 2020 to January 2021, as it always has during this time of the year. Bio parameter measurements made in monitor well MW-12 were significantly different than those made in the other wells, probably as a result of injections of PersulfOx™ into MW-12. The only concentrations of VOCs greater than AWQS or Tier 1 Corrective Action Standards were benzene, 1, 2-DCA and MTBE in MW-12.

Groundwater plume stability:
The only groundwater well with contamination over applicable regulatory standards is on-site well MW-12, associated with the former UST #3 basin. All other on-site and off-site wells show no VOC contamination present as of January 2021. The off-site perimeter groundwater wells have not shown any VOC contamination since August 2017.

Contaminant concentration trends of benzene, 1, 2-DCA, and MTBE in monitor well MW-12 between 2016 and 2020 were analyzed using the GSI Mann-Kendall Toolkit. The analysis shows all three parameters to be decreasing over this time interval, although there was an increase in the concentrations of benzene and MTBE from January 2020 to April 2020. The concentrations of these VOCs are statistically stable based on the January 2021 groundwater analytical results.

Natural Attenuation:
Natural attenuation processes include diffusion, dispersion, sorption, volatilization, and biodegradation. An overall 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.

Field measurements of temperature, conductivity, oxidation-reduction potential, oxygen, carbon dioxide, alkalinity, and ferrous iron, and laboratory measurements of nitrate, sulfate, manganese, and methane were sampled in April 2020 (5 months after PersulfOx™ injection). The oxygen concentration measured in the groundwater sample from monitor well MW-12 was lower than historical results, and lower than the measurements in the other wells. The oxygen concentrations in the groundwater samples from the other wells were similar to recent historical measurements. The carbon dioxide concentration in monitor well MW-12 is higher than the other wells as a result of degradation of hydrocarbons by the applied PersulfOx™. Ferrous iron was not detected in any of the groundwater samples. In monitor well MW-12, the sulfate concentration on April

28, 2020, was lower than in January 2020, and the manganese concentration was higher. Both parameters continue to be higher than the measurements in the other wells. Alkalinity measurements were similar to recent historic measurements, with the exception of monitor well MW-12, where the alkalinity measurement continues to be 0 mg/I. Historically, low pH and alkalinity measurements and high sulfate and manganese measurements have correlated with PersulfOx™ applications.

ADEQ requested additional post ISCO groundwater monitoring when the May 2020 request for LUST case closure was submitted.

On October 7, 2020, eleven months after the last PersulfOx™ application, Zelen personnel conducted compliance groundwater monitoring at the site. The work included measuring depth to groundwater in all 14 of the monitor wells associated with the site, low-flow purging and collection of groundwater samples in six monitor wells [MW-12, MW-13, MW-14, MW-15, MW-16, MW-17, MW-18], and measuring bioparameters in those six monitor wells.

On January 21, 2021, 14 months after the last PersulfOx™ application, Zelen personnel conducted compliance groundwater monitoring at the site. The work included measuring depth to groundwater in all 14 of the monitor wells associated with the site, low-flow purging and collection of groundwater samples in seven monitor wells [MW-12, MW-14, MW-16, MW-17, MW-18, MW-24, MW-25], and measuring bioparameters in those seven monitor wells.

- Ferrous iron was only detected in MW-12 (source area) at 5.4 mg/L, which has dropped since October 2020. As the ferrous iron concentrations drop, aerobic conditions will replace current anaerobic conditions.
- Sulfate concentrations within the remediated source area (5,000 mg/L) and concentrations outside the remediated source arear (<2,000 mg/L) indicate that ISCO injections have resulted in significant reserve quantities of the electron acceptor (sulfate) in the source area.
- Methane is reported only in MW-12, which is indicative of anaerobic microbial activity.
- Dissolved oxygen (DO) concentrations are the lowest (0.37 mg/L) in MW-12, but increase as the distance from MW-12 increases. This is indicative or anaerobic conditions in MW-12, and aerobic conditions in the other wells.
- The last measurement of nitrate in MW-12 (2.2 mg/L) was in April 2020. The lower concentrations of nitrate in the source area (<10 mg/L) indicate depletion of nitrate as an electron acceptor in these areas.

Threatened or impacted drinking water wells:
The Ray Bell Oil #416 site is located near the northeast corner of the Pinal Active Management Area (AMA) as defined by the Arizona Department of Water Resources (ADWR). The information in the following paragraph is summarized from the Arizona Water Atlas, Section 8.2, Water Resource Characteristics of the Pinal AMA, September 2010, published by the ADWR. Aquifers in the Pinal AMA are hosted by recent stream alluvium and basin fill with soil lithology ranging from clay to gravel. Regional groundwater flow is generally to the north, with

local flow toward several cones of depression near Maricopa. Natural aquifer recharge comes primarily from the stream beds of the Gila and Santa Cruz Rivers. Water from the Central Arizona Project is recharged in the western part of the Pinal AMA. Groundwater levels around Coolidge are reported to be continually falling, despite rising groundwater levels from recharge in other parts of the Pinal AMA.

A search of the ADWR Well Registry database reported 176 wells registered within one-half mile of the Site. All are registered as monitoring or remediation wells. The Arizona Water Company (AWC) provides groundwater to its Pinal Valley customers from wells located throughout the Casa Grande and Coolidge areas. According to the 2019 Annual Water Quality Report (PWSID NO. 11-009), VOCs are not required to be evaluated. There is one AWC well (#55-616606) located to the north-east (cross gradient) between ½ and 1 mile of the LUST site. According to ADWR imaged records, the use of the well is listed as municipal and industrial. The original well drilled in the 1950s is 1100 feet deep, slotted for its entire depth. In 2007, new 16" copper-bearing casing was inserted down to about half the depth of the well (584 ft.); the new casing is not slotted from 0-200 feet. ADWR records show well #55-606187 is located down-gradient from the Site between ½ and 1 mile. This non-exempt well was drilled in the 1940s to a depth of 550 feet to irrigate 145 acres.

According to ADWR, any new or replacement well located at or near the LUST site would need to meet the criteria of A.A.C. R12-15-1302 (B) (3).

Other exposure pathways:
The site is currently vacant and has past commercial use, and any development in the foreseeable future will probably continue to have commercial use. This part of Coolidge consists of commercial property along Arizona Boulevard. Residences are located on the adjacent properties to the west, northwest and southwest. A commercial business is located north of the site. An ambulance substation and a pizza restaurant are located south of the site. Arizona Boulevard is located to the east of the site, and beyond that are commercial businesses. There are no hospitals, schools, day care facilities, or nursing homes located within 500 feet of the site, and the site is not located in or near an ecologically sensitive area.

In June and October 2010, boreholes were drilled on-site by EnTech. At release 3169.01, borehole EB-18 (MW-24) was drilled to a depth of 105 feet bgs. Analytical results for soil samples collected in borehole EB-18 contained VOCs at concentrations greater than residential soil remediation levels (rSRLs) from 20 feet bgs and deeper. At release 3169.02, borehole EB-4 (MW-12) was drilled to a depth of 105 feet bgs, and boreholes EB-6 and EB-7 were drilled to depths of 75 feet bgs. Analytical results for soil samples collected in boreholes EB-4, EB-6, and EB-7 contained VOC concentrations greater than rSRLs at 15 feet bgs and deeper. VOC concentrations greater than rSRLs were also measured from 35 feet bgs to groundwater in the borehole for monitor well MW-25.

On June l, 2017, soil confirmation boreholes CB-1 at release 3169.0l and CB-2 at release 3169.02 were drilled by Zelen and soil samples were collected at 15 and 20 feet bgs in each of the boreholes. Boreholes CB-3 (release 3169.03) and CB-4 (release 3169.04) were drilled to a

depth of 10 feet bgs with soil samples analyzed at depths of 5 and 10 feet bgs. In the soil sample collected at 20 feet bgs in borehole CB-2, naphthalene was measured at a concentration greater than the rSRL as a VOC, but not as a polyaromatic hydrocarbon (PAH). The PAH analysis is the more accurate laboratory method for naphthalene. All other analytical results for VOCs and tetra-ethyl lead were less than the rSRLs. LUST release 3169.03 and 3169.04 were eligible for closure based on this data.

On June l, 2017, vapor probes were drilled and installed to 5 feet bgs for the purpose of conducting an exposure evaluation by the vapor inhalation pathway. Five vapor probes were installed near release 3169.01 (V-lA through V-1E), five near release 3169 .02 (V-2A through V-2E), and three between release 3169.03, release 3169.04, and MW-25. The only VOC detected in any vapor sample was a low concentration of toluene (4.67 micrograms per cubic meter) in sample V-1A. The toluene concentration was entered into a Screening-Level Johnson and Ettinger Model, Forward Calculation, on the EPA website and the hazard quotient was calculated to be less than one. The inhalation exposure pathway from soil and groundwater to receptors is not complete. The *Periodic Site Status Report* (PSSR) dated June 30, 2017 provides specific information.

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 completed 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 conditions:

Groundwater data for MW-2R (UST #2 and #3 location)

Date	**Benzene AWQS 5.0 µg/L**	**MTBE Tier 1 Corrective Action Standard 94 µg/L**	**1,2-DCA AWQS 5.0 µg/L**	**Depth to Water (feet)**
September 1997	**43,000**	Not analyzed	Not analyzed	65.26
December 1997	**41,000**	Not analyzed	Not analyzed	64.49
March 1998- March 2002 not sampled	---	---	---	67.30-73.54
July 2002	**43,000**	Not analyzed	Not analyzed	76.06
September 2002 not sampled or measured	---	---	---	---
December 2002	**42,000**	Not analyzed	Not analyzed	74.92

March 2003	**47,000**	Not analyzed	Not analyzed	76.01
August 2008	---	---	---	**Dry at 73.35**

Groundwater data for MW-12 (former UST #2 and #3 location; L 3169.02)
Total Depth: 105 feet. Screened 10-105 feet.

Date	**Benzene AWQS 5.0 µg/L**	**MTBE Tier 1 Corrective Action Standard is 94 µg/L**	**1,2-DCA AWQS is 5.0 µg/L**	**Depth to Water (feet)**
November 2010	**1,700**	**620**	**<100**	71.70
2011 SVE/AS start	**---**	**---**	**---**	---
November 2012	**330**	**1,700**	**<100**	78.69
May 2013	**10,000**	**15,000**	**170**	80.62
August 2013	**75**	**1,400**	**21**	81.54
November 2013	**72**	**1,300**	**41**	80.44
February 2014	**5.8**	**1,300**	**<20**	80.41
May 2014	**11**	**1,400**	**89**	83.21
August 2014	**460**	**1,600**	**22**	84.05
August 2015	**6,500**	**7,600**	**210**	84.77
August 2016 SVE end	**7,200**	**8,100**	**170**	87.00
May 2017 ISCO start & AS end	**---**	**---**	**---**	---
June 2017 ISCO	**---**	**---**	**---**	---
August 2017	**660**	**1,100**	**27**	90.10
March 2018 ISCO	**---**	**---**	**---**	---
September 2018	**390**	**980**	**16**	92.32
December 2018	**960/1,100**	**1,100/1,200**	**20/<19**	89.78
March 2019	**1,700/1,600**	**2,000/1,900**	**<19/<19**	88.50
June 2019	**1,600**	**1,900**	**<19**	92.00
November 2019 ISCO	---	---	**---**	---
January 2020	**31/31**	**170/180**	**110/120**	90.67
April 2020	**140/84**	**540/450**	**28/23**	91.46
October 2020	**210/200**	**1,100/1,000**	**<19/<19**	92.98
January 2021	**190/210**	**670/700**	**22/24**	90.65

Groundwater data for MW-15 (appx. 170 feet down gradient of MW-12)
Total Depth: 105 feet. Screened 10-105 feet.

Date	Benzene AWQS 5.0 µg/L	MTBE Tier 1 Corrective Action Standard 94 µg/L	1,2-DCA AWQS 5.0 µg/L	Depth to Water (feet)
November 2010	<1.0	3.7	<1.0	70.50
November 2012	<0.50	<1.0	<1.0	77.04
May 2013	<0.50	<1.0	<1.0	79.03
August 2013	<0.50	<1.0	<1.0	79.90
November 2013	<0.50	<1.0	<1.0	78.81
February 2014	<0.50	<1.0	<1.0	78.79
May 2014	<0.50	<1.0	<1.0	81.58
August 2014	<0.50	<1.0	<1.0	82.43
August 2015	<0.21	<0.58	<0.38	83.08
August 2016	<0.21	<0.58	<0.38	85.33
August 2017	<0.21	<0.58	<0.38	88.34
September 2018	<0.21	<0.58	<0.38	90.59
December 2018	<0.21	<0.58	<0.38	87.96
March 2019	<0.21	<0.58	<0.38	86.80
June 2019	<0.21	<0.58	<0.38	90.32
January 2020	<0.21	<0.58	<0.38	88.82
April 2020	<0.21	<0.58	<0.38	89.71
January 2021	<0.21	<0.58	<0.38	88.88

Groundwater data for MW-24 (up gradient of MW-12)
Associated with the .01 release
Total Depth: 105 feet. Screened 10-105 feet.

Date	Benzene AWQS 5.0 µg/L	MTBE Tier 1 Corrective Action Standard 94 µg/L	1,2-DCA AWQS 5.0 µg/L	Depth to Water (feet)
November 2010	**360**	**390**	**160**	70.99
November 2012	<0.50	<1.0	<1.0	78.48
May 2013	<0.50	<2.00	**70**	80.46
August 2013	<0.50	1.3	2.8	81.37
November 2013	<0.50	<1.0	<1.0	80.25
February 2014	<0.50	<1.0	3.2	80.25
May 2014	<0.50	2.2	**10**	83.03
August 2014	<0.50	<1.0	<1.0	83.87
August 2015	<0.21	<0.58	0.40	84.55
August 2016	<0.21	<0.58	<0.38	86.83
August 2017	<0.21	<0.58	<0.38	89.86
September 2018	<0.21	<0.58	<0.38	92.10

December 2018	<0.21	<0.58	0.73	89.58
March 2019	<0.21	<0.58	<0.38	88.28
June 2019	<0.21	<0.58	<0.38	91.82
January 2020	<0.21	<0.58	<0.38	90.29
April 2020	<0.21	<0.58	<0.38	91.21
January 2021	<0.21	<0.58	<0.38	90.41

Groundwater data for MW-17
(up gradient of MW-24 [up gradient well for both releases])
Total Depth: 105 feet. Screened 10-105 feet.

Date	**Benzene AWQS 5.0 µg/L**	**MTBE Tier 1 Corrective Action Standard 94 µg/L**	**1,2-DCA AWQS 5.0 µg/L**	**Depth to Water (feet)**
November 2010	<1.0	**140**	2.80	71.56
November 2012	<0.50	<1.0	3.0	78.11
May 2013	<0.50	3.8	**21**	80.03
August 2013	<0.50	2.2	**9.4**	81.02
November 2013	<0.50	<1.0	<1.0	79.88
February 2014	<0.50	<1.0	3.5	79.90
May 2014	<0.50	2.3	**7.7**	82.68
August 2014	<0.50	<1.0	<1.0	83.51
August 2015	<0.21	<0.58	0.76	84.20
August 2016	<0.21	<0.58	0.54	86.48
May 2017- December 2018 not sampled	---	---	---	87.15-89.12
March 2019	<0.21	<0.58	<0.38	87.93
June 2019	<0.21	<0.58	<0.38	91.46
January- October 2020 not sampled	<0.21	<0.58	<0.38	89.82-92.41
January 2021	<0.21	<0.58	<0.38	90.05

Groundwater data for MW-14 (cross gradient of MW-12)
Total Depth: 105 feet. Screened 10-105 feet.

Date	**Benzene AWQS 5.0 µg/L**	**MTBE Tier 1 Corrective Action Standard 94 µg/L**	**1,2-DCA AWQS 5.0 µg/L**	**Depth to Water (feet)**
November 2010	**410**	**220**	**<10**	71.10
November 2012	**170**	**100**	**12**	77.71
May 2013	**6.2**	9.3	1.5	79.68
August 2013	<0.50	2.8	<1.0	80.59
November 2013	<0.50	<1.0	<1.0	79.47

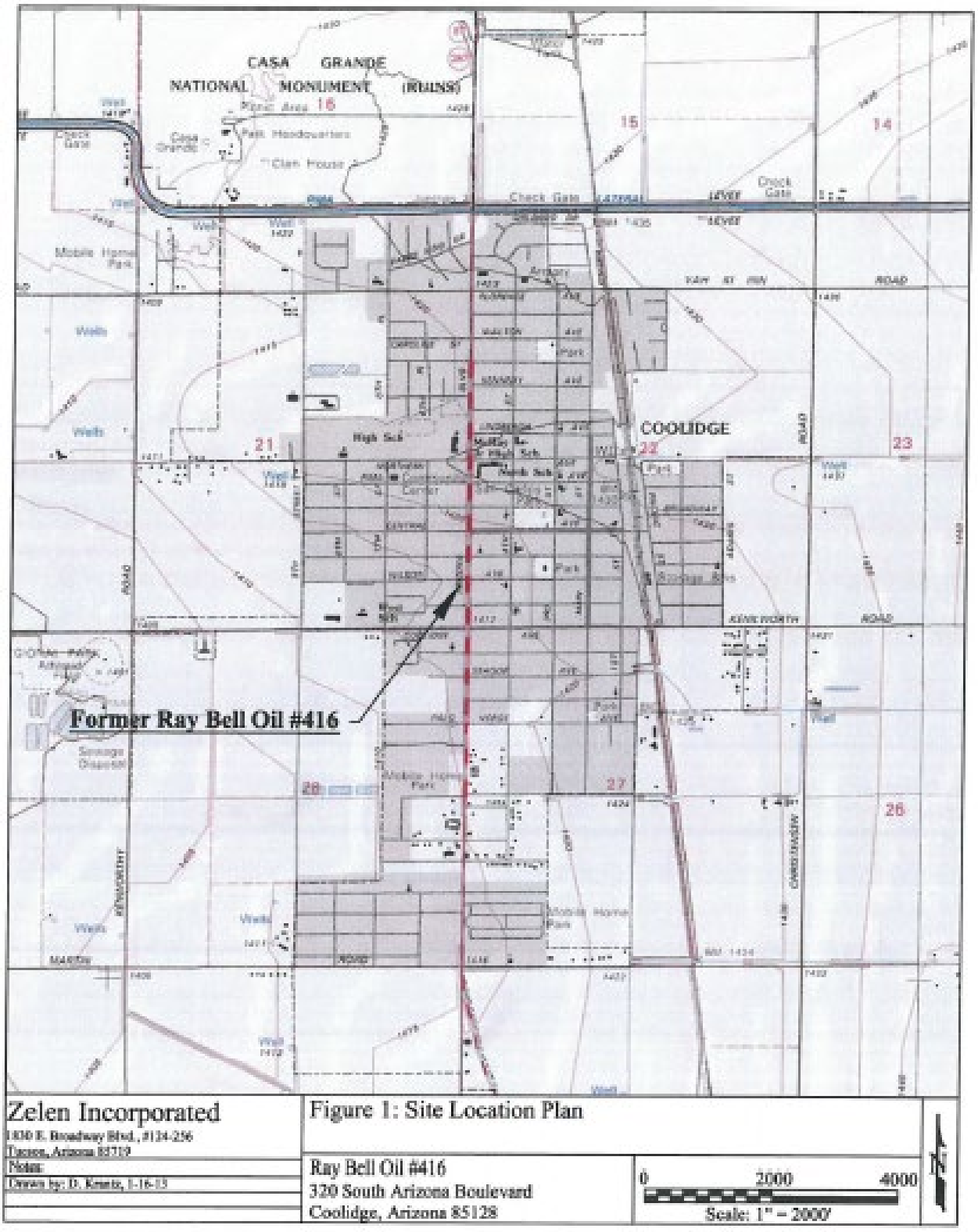
February 2014	<0.50	<1.0	<1.0	79.50
May 2014	<0.50	2.5	<1.0	82.25
August 2014	<0.50	<1.0	<1.0	83.09
August 2015	<0.21	<0.58	<0.38	83.75
August 2016	<0.21	<0.58	<0.38	86.02
August 2017	<0.21	<0.58	<0.38	89.05
September 2018	<0.21	<0.58	<0.38	91.30
December 2018	<0.21	<0.58	<0.38	88.60
March 2019	<0.21	<0.58	<0.38	87.54
June 2019	<0.21	<0.58	<0.38	91.05
January 2020	<0.21	<0.58	<0.38	89.57
April 2020	<0.21	<0.58	<0.38	90.42

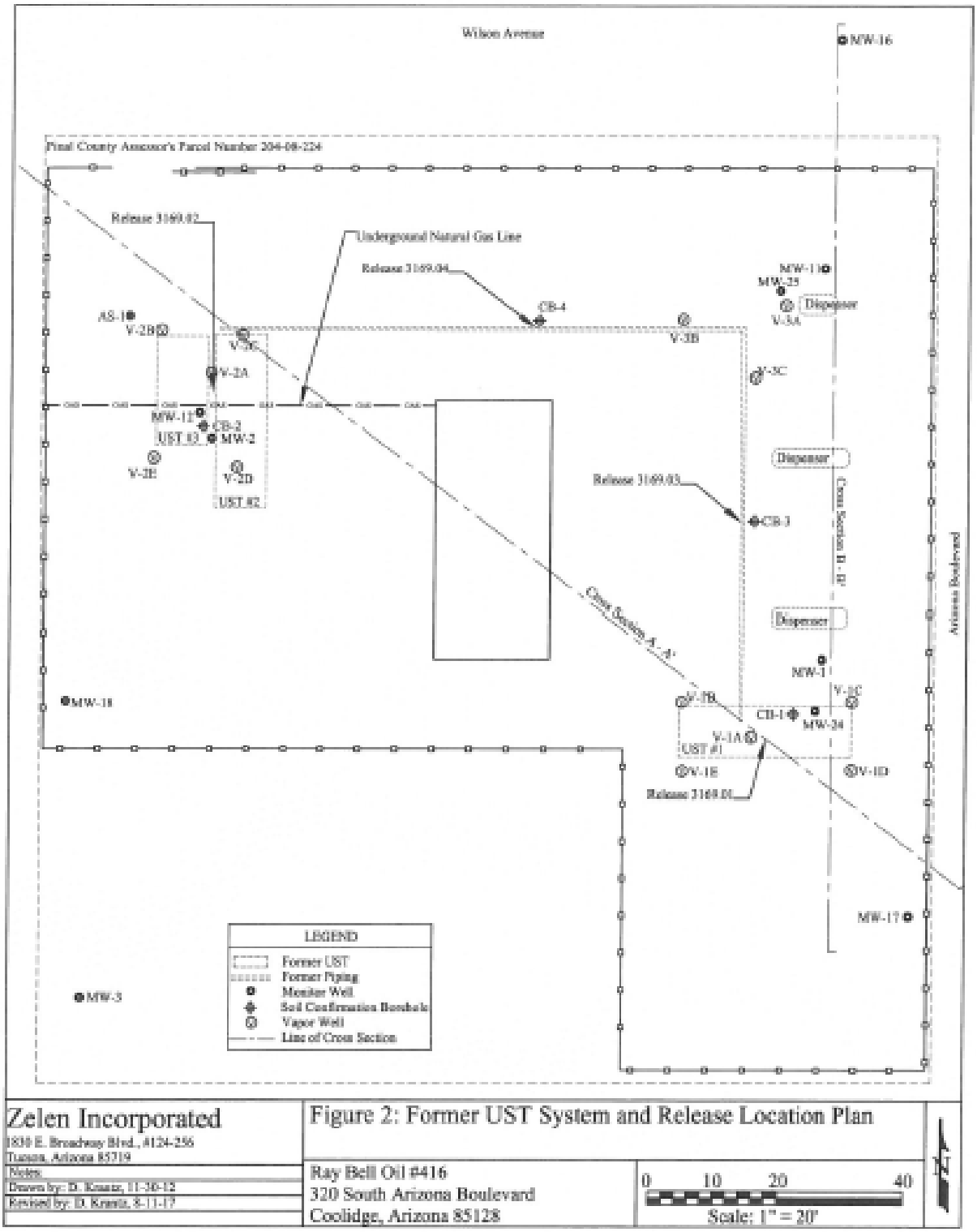
Groundwater data for MW-18 (cross gradient of MW-12)
Total Depth: 105 feet. Screened 10-105 feet.

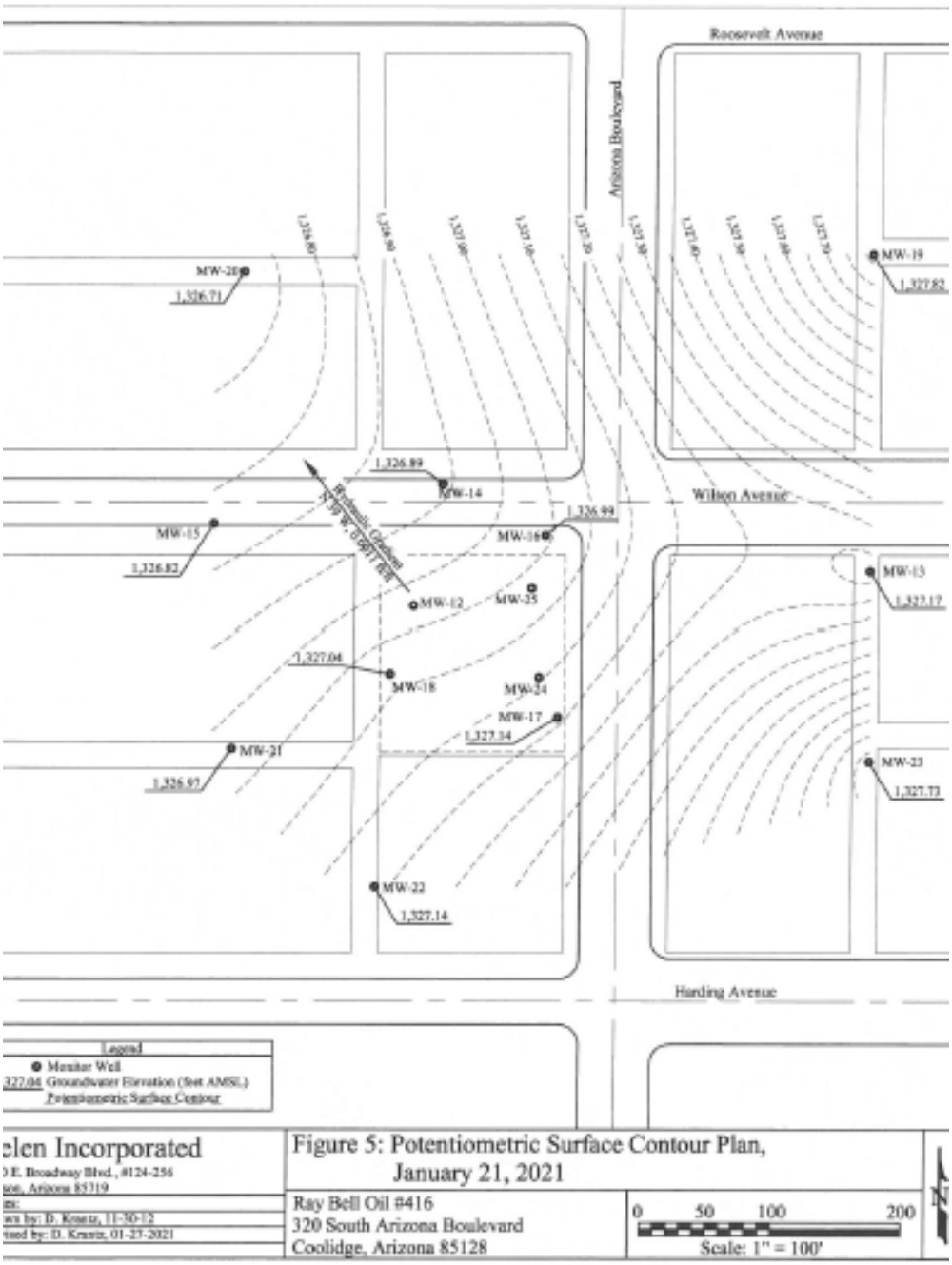
Date	**Benzene AWQS 5.0 µg/L**	**MTBE Tier 1 Corrective Action Standard 94 µg/L**	**1,2-DCA AWQS 5.0 µg/L**	**Depth to Water (feet)**
November 2010	**2,200**	**1,500**	**230**	72.21
November 2012	<5.0	**670**	**150**	78.76
May 2013	<5.0	**450**	**400**	80.71
August 2013	<2.5	**97**	**200**	81.63
November 2013	<2.5	91	**360**	80.51
February 2014	<5.0	**110**	**340**	80.51
May 2014	<5.0	**120**	**140**	83.32
August 2014	<5.0	**160**	**83**	84.05
August 2015	<0.42	46	**51**	84.86
August 2016	<0.21	0.68	4.0	87.12
May 2017- December 2018 not sampled	---	---	---	87.82-89.87
March 2019	<0.21	0.63	0.71	88.56
June 2019	<0.21	<0.58	<0.38	92.10
January- October 2020 not sampled	---	---	---	90.44-93.05
January 2021	<0.21	<0.58	<0.38	90.61

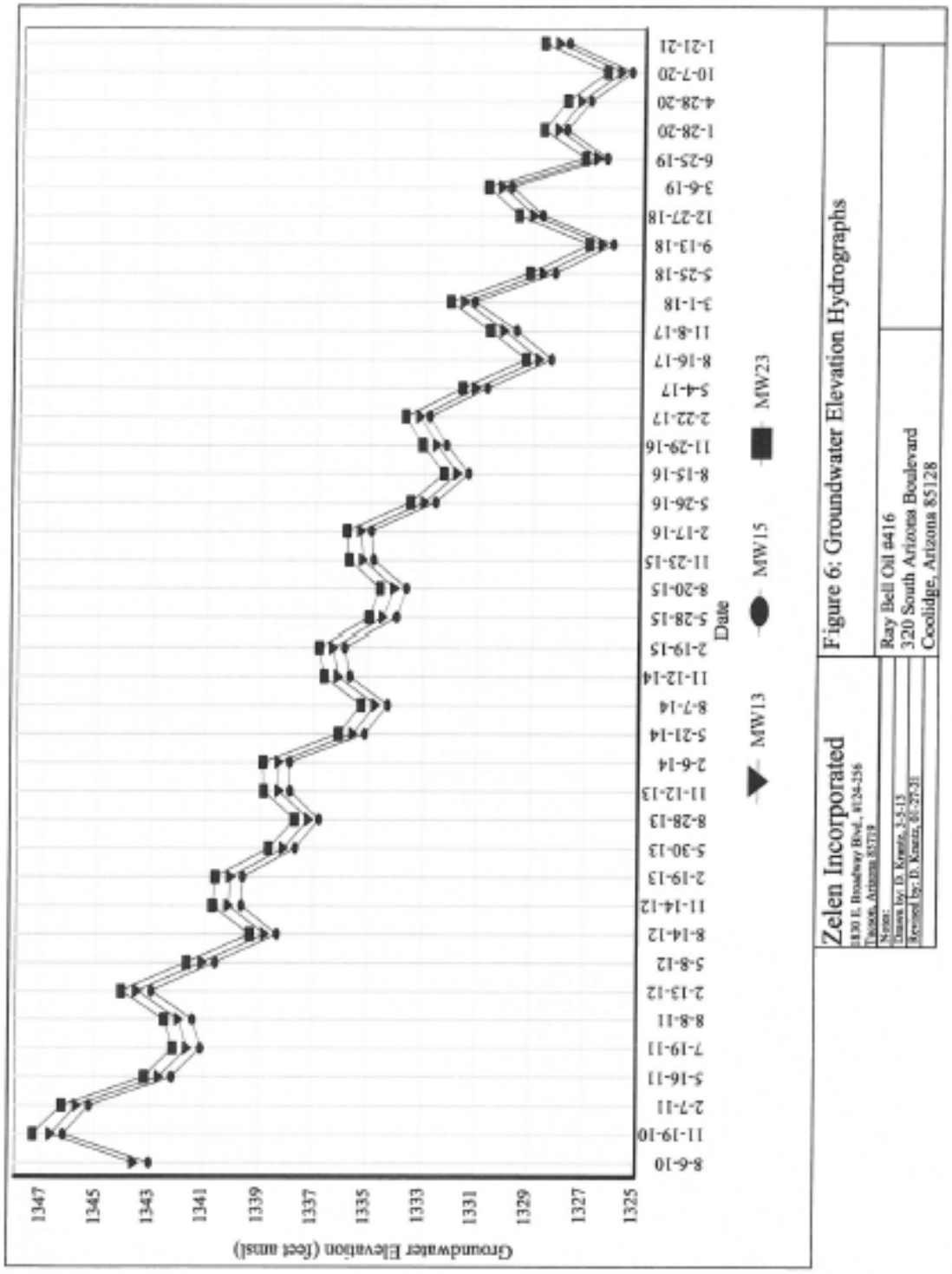
Groundwater data for MW-25 (cross gradient to MW-12)
Total Depth: 105 feet. Screened: 10-105 feet.

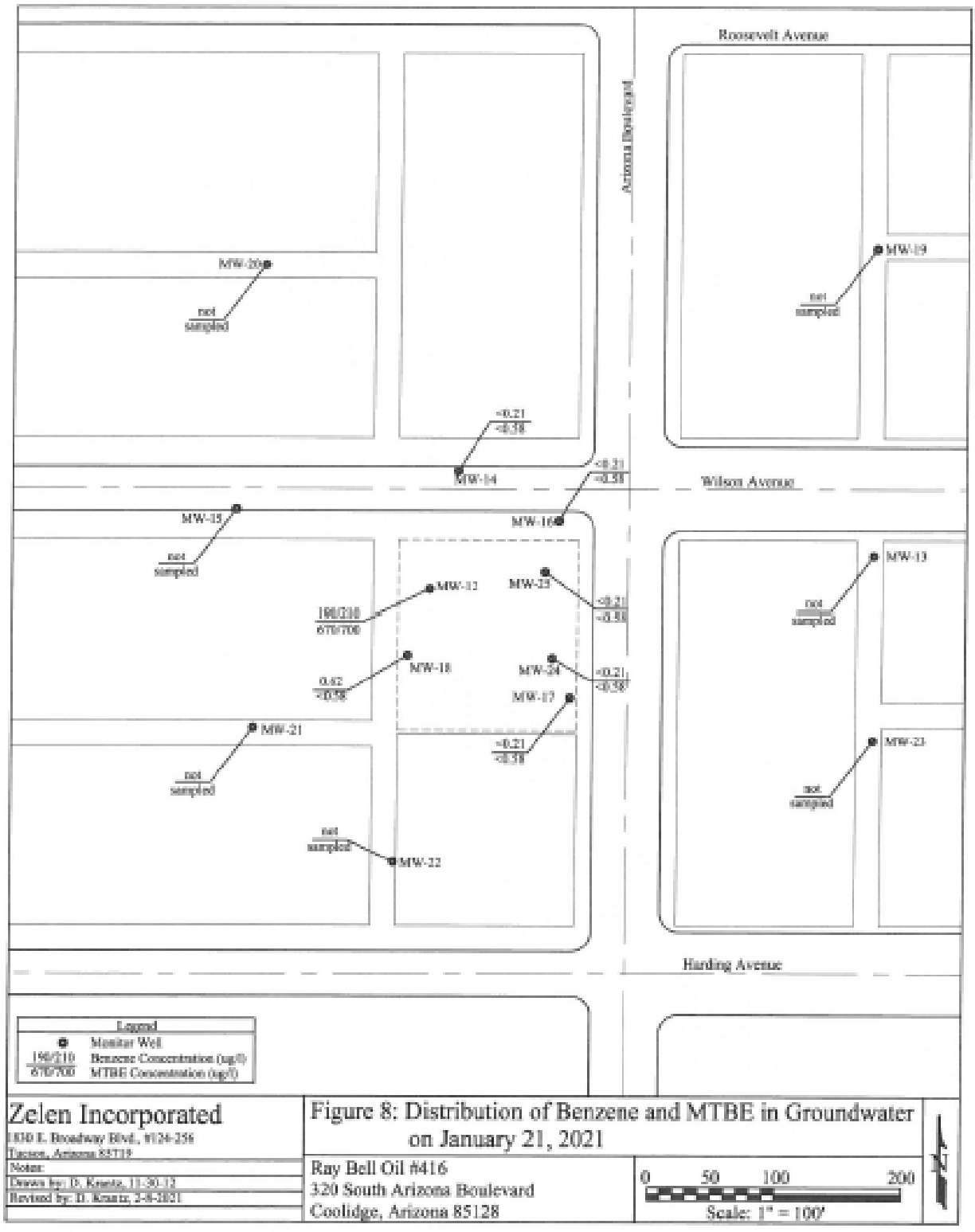
Date	Benzene AWQS 5.0 µg/L	MTBE Tier 1 Corrective Action Standard 94 µg/L	1,2-DCA AWQS 5.0 µg/L	Depth to Water (feet)
November 2010	**2,600**	**<100**	**<100**	70.20
November 2012	**74**	<50	**<50**	78.67
May 2013	**1,500**	<50	**<50**	80.63
August 2013	**240**	40	**17**	81.55
November 2013	**360**	<20	**<20**	80.44
February 2014	**7.7**	<10	**<10**	80.42
May 2014	**440**	<10	**19**	83.21
August 2014	**71**	<10	**11**	84.05
August 2015	**69**	<1.16	**7.5**	84.75
August 2016	**50**	<5.8	**9.6**	86.99
August 2017	0.22	<0.58	<0.38	90.04
September 2018	<0.21	<0.58	<0.38	92.32
December 2018	0.33	<0.58	<0.38	89.79
March 2019	0.22	<0.58	<0.38	89.48
June 2019	2.0/0.92	<0.58/<0.58	<0.38/<0.38	92.00
January 2020	0.54	<0.58	<0.38	90.50
April 2020	<0.21	<0.58	<0.38	91.41
October 2020	<0.21	<0.58	<0.38	92.99
January 2021	<0.21	<0.58	<0.38	90.61


CASA GRANDE
NATIONAL MONUMENT (RUINS)
COOLIDGE
Former Ray Bell Oil #416
Zelen Incorporated
1430 E. Broadway Blvd., #124-256
Tucson, Arizona 85719
Figure 1: Site Location Plan
Ray Bell Oil #416
320 South Arizona Boulevard
Coolidge, Arizona 85128
0 2000 4000
Scale: 1" = 2000'

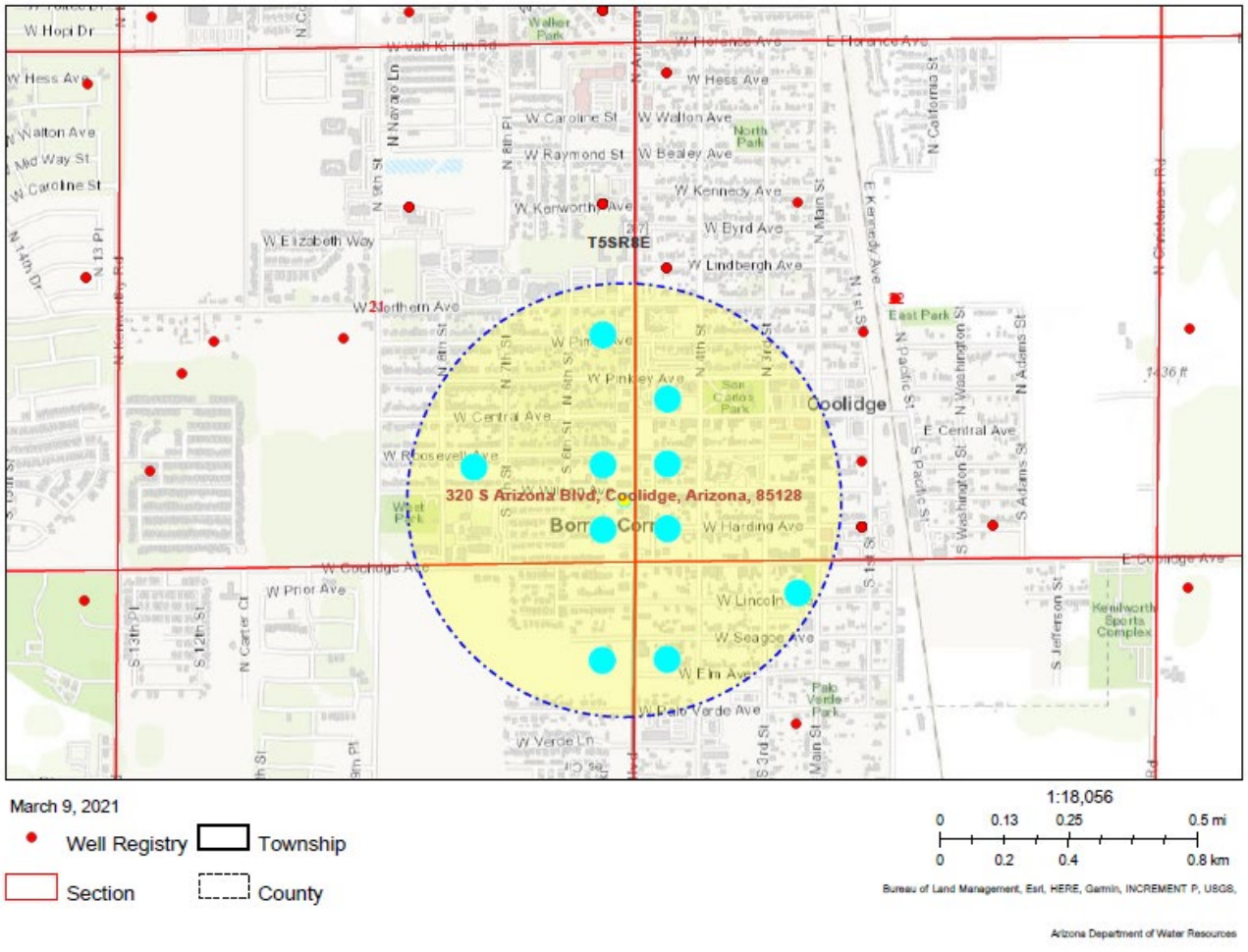

Wilson Avenue
MW-16
Final County Assessor's Parcel Number 204-08-224
Release 3169.02
Underground Natural Gas Line
Release 3169.04
CB-4
MW-11
MW-25
Dispenser
V-3A
AS-1
V-2B
V-2C
V-2A
V-3B
V-3C
MW-12
CB-2
UST #3
MW-2
V-2E
V-2D
UST #2
Dispenser
Release 3169.03
CB-3
Cross Section B - B'
Arizona Boulevard
Cross Section A - A'
Dispenser
MW-1
MW-18
V-1B
V-1C
CB-1
MW-24
V-1A
UST #1
V-1E
V-1D
Release 3169.01
MW-17
MW-3
LEGEND
Former UST
Former Piping
Monitor Well
Soil Confirmation Borehole
Vapor Well
Line of Cross Section
Zelen Incorporated
1830 E. Broadway Blvd., #124-256
Tucson, Arizona 85719
Notes:
Drawn by: D. Krantz, 11-30-12
Revised by: D. Krantz, 8-11-17
Figure 2: Former UST System and Release Location Plan
Ray Bell Oil #416
320 South Arizona Boulevard
Coolidge, Arizona 85128
0 10 20 40
Scale: 1" = 20'


Roosevelt Avenue
Arizona Boulevard
Wilson Avenue
Harding Avenue
MW-20
1,326.71
MW-19
1,327.82
1,326.89
MW-14
1,326.99
MW-15
1,326.82
MW-16
MW-12
MW-25
MW-13
1,327.17
1,327.04
MW-18
MW-24
MW-17
1,327.34
MW-21
1,326.97
MW-23
1,327.73
MW-22
1,327.14
Legend
Monitor Well
Groundwater Elevation (feet AMSL)
Potentiometric Surface Contour
elen Incorporated
E. Broadway Blvd., #124-256
on, Arizona 85719
Figure 5: Potentiometric Surface Contour Plan,
January 21, 2021
Ray Bell Oil #416
320 South Arizona Boulevard
Coolidge, Arizona 85128
0 50 100 200
Scale: 1" = 100'


Groundwater Elevation (feet amsl)
1347
1345
1343
1341
1339
1337
1335
1333
1331
1329
1327
1325
Date
8-6-10
11-19-10
2-7-11
5-16-11
7-19-11
8-8-11
2-13-12
5-8-12
8-14-12
11-14-12
2-19-13
5-30-13
8-28-13
11-12-13
2-6-14
5-21-14
8-7-14
11-12-14
2-19-15
5-28-15
8-20-15
11-23-15
2-17-16
5-26-16
8-15-16
11-29-16
2-22-17
5-4-17
8-16-17
11-8-17
3-1-18
5-25-18
9-13-18
12-27-18
3-6-19
6-25-19
1-28-20
4-28-20
10-7-20
1-21-21
MW13
MW15
MW23
Figure 6: Groundwater Elevation Hydrographs
Zelen Incorporated
Ray Bell Oil #416
320 South Arizona Boulevard
Coolidge, Arizona 85128


Roosevelt Avenue
Arizona Boulevard
Wilson Avenue
Harding Avenue
MW-20
not sampled
MW-19
not sampled
<0.21
<0.58
MW-14
<0.21
<0.58
MW-16
MW-15
not sampled
MW-12
MW-23
<0.21
<0.58
190/210
670/700
MW-18
0.62
<0.58
MW-24
<0.21
<0.58
MW-17
<0.21
<0.58
MW-21
not sampled
not sampled
MW-22
MW-13
not sampled
MW-23
not sampled
Legend
Monitor Well
190/210 Benzene Concentration (ug/l)
670/700 MTBE Concentration (ug/l)
Zelen Incorporated
1550 E. Broadway Blvd., #124-256
Tucson, Arizona 85719
Notes:
Drawn by: D. Krantz, 11-30-12
Revised by: D. Krantz, 2-8-2021
Figure 8: Distribution of Benzene and MTBE in Groundwater on January 21, 2021
Ray Bell Oil #416
320 South Arizona Boulevard
Coolidge, Arizona 85128
0 50 100 200
Scale: 1" = 100'

Ray Bell #416


W Hopi Dr
W Hess Ave
W Walton Ave
W Mid Way St
W Caroline St
W Elizabeth Way
W Raymond St
W Kenworthy Ave
W Bealey Ave
W Kennedy Ave
W Byrd Ave
W Lindbergh Ave
W Northern Ave
T5SR8E
W Pinkley Ave
W Central Ave
W Roosevelt Ave
W Harding Ave
W Prior Ave
W Lincoln
W Seagoe Ave
W Elm Ave
W Palo Verde Ave
W Verde Ln
320 S Arizona Blvd, Coolidge, Arizona, 85128
Coolidge
East Park
San Carlos Park
Palo Verde Park
Kenilworth Sports Complex
N Navajo Ln
N Main St
N Arizona Blvd
N California St
N Washington St
S Jefferson St
March 9, 2021
Well Registry
Township
Section
County
1:18,056
0 0.13 0.25 0.5 mi
0 0.2 0.4 0.8 km
Bureau of Land Management, Esri, HERE, Garmin, INCREMENT P, USGS,
Arizona Department of Water Resources