

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

**LUST Case File # 4366.01 & .02 One Camelback Building
Facility ID # 0-008848 1 East Camelback Road
Maricopa County Phoenix, Arizona 85012**

Background:

Former ExxonMobil Service Station # 77846 is located at 1 East Camelback Road in Phoenix, at the southeastern corner of the intersection of East Camelback Road and North Central Avenue. The site was formerly occupied by the service station between 1942 through 1973. The USTs were removed in 1980. Based on analytical results for soil and groundwater samples collected near former gasoline dispenser piping at the site in 1991, ADEQ opened LUST file numbers 4366.01 and 4366.02 for gasoline releases from the northern and western dispenser island piping, respectively in 1997.

During construction of the former One Camelback Incorporated (OCI) building between 1983 to 1985 soil under the footprint of the building was excavated to depths of 40 to 50 feet below ground surface (bgs) to allow for development of the underground parking structure, which included a substantial portion of the area underneath the former service station. In 1989, groundwater began to infiltrate into Basement Level 5 of the site building underground parking garage. In 1990, the property owner OCI installed 14 sumps, each equipped with a single sump pump, and two lateral drains in the basement to remove the infiltrating groundwater. In the fall of 1993, a granulated activated carbon (GAC) system was installed in the basement to treat the groundwater for OCI prior to discharge to the City of Phoenix (COP) storm water sewer system.

At the request of ExxonMobil Environmental Services Company, on behalf of ExxonMobil Oil Corporation (ExxonMobil), ETIC prepared a *Corrective Action Completion Report, Former Service Station 77846, One East Camelback Road, Phoenix, Arizona* received October 4, 2018.

The site is located within the boundaries of the Central and Camelback Water Quality Assurance Revolving Fund (WQARF) site. The groundwater contaminants associated with the WQARF site are tetrachloroethylene (PCE) from former off-site drycleaner operations, and trichloroethylene (TCE) which is a decomposition compound of PCE. These chlorinated VOCs are not attributable to historical LUST release of petroleum VOCs at the site. In January 2003, ADEQ completed construction of a groundwater pump and treat (P&T) system to remediate and control the migration of PCE and TCE- contaminated groundwater. The groundwater P&T system was shut down in October 2018 due to low groundwater extraction rates and low contaminant influent concentrations.

The multi-story office building was sold and is being redeveloped into a multi-story condominium building with office space on the ground level. The multi-level subterranean parking garage is still present.

The WQARF program wanted the LUST case closure delayed until the program decided on a remedial method for the remaining chlorinated solvent contamination in groundwater. A remedial record of decision (ROD) is currently in progress. As part of the ROD, the WQARF program is currently negotiating with the property owner to take over the de-watering system to continue the remediation of

chlorinated solvents in the groundwater. The WQARF program and the UST program have agreed that if the discharge permit limits are exceeded for petroleum hydrocarbons, the LUST release would be re-opened and ExxonMobil would provide remedial support to the WQARF program.

Based upon the results of remedial activities and site specific information, the above-referenced LUST site is eligible for alternative LUST closure under Arizona Revised Statutes (A.R.S.) §49-1005(E). Arizona Administrative Code (A.A.C.) R18-12-263.04 allows case closure of a LUST site with groundwater contamination above the Arizona AWQS or Tier 1 Corrective Action Standards.

Removal or control of the source of contamination:

In July 1999, a soil vapor extraction (SVE) pilot test was conducted using temporary vapor wells which were then abandoned. New SVE wells were installed near the pilot test wells in February 2000 along with a treatment system for the site to operate in conjunction with OCI's dewatering system. The treatment system, which consisted of an air stripper and vapor phase GAC vessels, operated initially from December 2000 to April 2001. From April 2002 through December 2008, SVE with catalytic oxidation (CATOX) for soil remediation and emissions abatement, respectively, was performed at the site. The SVE/CATOX system was shut down on January 1, 2009 because asymptotic influent concentrations had been attained suggesting that hydrocarbon mass removal had reached a practical limit of remediation. From April 2002 to February 2017, the air stripper system with GAC emissions abatement operated to treat water associated with OCI's dewatering system. The dewatering system and water discharge compliance was managed by OCI, and the air stripper treatment system was operated and maintained by ExxonMobil. Groundwater influent concentrations in conjunction with untreated discharge vapor concentrations indicated that groundwater from OCI's dewatering system had reached low- to non-detect levels of petroleum hydrocarbons. On February 7, 2017, the air stripper treatment system was permanently shut down and permanently removed in March 2017 by ETIC.

Characterization of the groundwater plume:

Based on WQARF site information, groundwater flow direction in the site vicinity historically has been north-northwest. However, in 2015 it was generally toward the south-southeast. This change is attributed to the canal lining, pumping from Salt River Project (SRP) irrigation wells, the WQARF well pumping system, and the dewatering system at the site. The *Groundwater Monitoring Report – March 2020*. Groundwater flow direction was towards the south-southeast with a hydraulic gradient of approximately 0.001 to 0.002 feet per foot, which is generally consistent with past calculations.

MWA-09 and MWA-10 are located in Camelback Road, which is on the north side of the site. One dewatering well (DW-N2), is located to the south of MWA-09. This well was last sampled in March 2020. A few petroleum related COCs were reported in the groundwater sample at concentrations below Arizona Aquifer Water Quality Standards (AWQS). The most recent groundwater data from MWA-09 and MWA-10 was collected in March 2019. The maximum dissolved-phase concentrations that exceed an AWQS is 1,2-dichloroethane (1,2-DCA) at 96 micrograms per liter ($\mu\text{g/L}$) and benzene at 12 $\mu\text{g/L}$ in MWA-09. These wells have been inaccessible for groundwater sampling due to site construction since March 2019. 1,2-DCA is found in leaded gasoline, which was historically dispensed at the this former ExxonMobil station.

In early 2019, the WQARF program installed two monitoring wells (CC-20 and CC-21) located to the south and southeast (down gradient) of the site. Groundwater data from installation through March 2020 shows no volatile organic compounds (VOCs) reported over laboratory reporting limits.

Groundwater plume stability:

The distribution of petroleum fuel constituents in the site vicinity is complex due to the changes in groundwater flow direction that have occurred over the years, ongoing pumping from dewatering wells beneath the site, and the presence of other sources of groundwater impacts including Maroney's Drycleaners to the east, and other former fuel service station LUST sites located at the northeast and northwest corners of the Central Avenue and Camelback Road intersection. The December 2014 Remedial Investigation (RI) Report for the Central and Camelback WQARF site identifies the specific facilities contributing to groundwater impacts. The groundwater elevations shown in the figures indicate that in 1999 the general direction of groundwater flow in the immediate site vicinity was to the west-northwest, and the dissolved-phase BTEX concentrations were limited to the northwestern portion of the site. In 2002, groundwater flow was generally southwest to northwest, converging to a low beneath the site likely due to dewatering activities; dissolved-phase BTEX was present in well MWA-04 north of the site at that time. In 2016, groundwater flow in the site vicinity was generally to the southeast, which is similar to the regional flow shown in RI Report. The groundwater flow direction remains to the southeast as of March 2020.

ETIC conducted statistical analyses using the Mann-Kendall trend test method were conducted for the available groundwater monitoring data collected since February 2012 (first monitoring date for wells MWA-09 and MWA-10) through 2018. Concentration trends were evaluated for the two wells, which are sampled quarterly. Concentration trends were evaluated for dissolved-phase potential constituents of concern (benzene, ethylbenzene, and 1, 2-DCA). The objective of this evaluation was to determine whether statistically significant concentration trends exist for these potential contaminants of concern (COCs). Trend analyses for benzene in wells MWA-09 and MWA-10, and ethylbenzene in well MWA-10 indicate a significant decreasing trend. Trend analysis for ethylbenzene in well MWA-09 does not indicate a significant trend, but the concentrations have continued to decline. Trend analysis for 1, 2-DCA in wells MWA-09 and MWA-10 did not indicate a significant declining trend; however, this may be due to limited results reporting concentrations above the detection limit since 2012. It is noted that the detection limit for 1, 2-DCA has historically exceeded the AWQS. Current groundwater data shows the 1,2-DCA concentration has increased in MWA-09, but the near-by well DW-N2 still shows 1,2-DCA below AWQS, as does the off-site down gradient wells CC-20 and CC-21.

Natural Attenuation:

Natural attenuation processes include diffusion, dispersion, sorption, volatilization, and biodegradation. Natural attenuation parameters were collected in the First Quarter 2018 groundwater sampling event on February 22, 2018 and in the Second Quarter 2018 groundwater sampling event on May 16, 2018. Site geochemistry analysis determines the impact of petroleum hydrocarbons on geochemical parameters relative to the surrounding environment. Analysis of geochemical data was used to evaluate biodegradation beneath the site. Changes in geochemical parameters that correlate with changes in constituent concentrations are an indication of biodegradation. This data analysis provides a secondary line of evidence indicating that reductions in constituent concentrations may in part be due to biodegradation and not solely to dilution and dispersion, which do not alter the geochemical conditions. Methane detected in both wells indicates that methanogenesis is occurring in the anaerobic degradation of petroleum hydrocarbons. Low to non-detect sulfate and nitrate concentrations in both wells also may be an indication that they are being used as electron acceptors during anaerobic degradation of hydrocarbons. Based on analysis of the geochemical data, site conditions indicate that anaerobic biodegradation of petroleum hydrocarbons is occurring beneath the site. Use of the BIOSCREEN model to simulate biodegradation and groundwater concentrations over time and distance was considered. However, given

the complexity of the hydrogeology in the region (i.e. changes in flow direction and the decline of groundwater elevations) and existence of multiple offsite sources, BIOSCREEN was not used.

Natural attenuation of petroleum hydrocarbons and other organic contaminants is driven by naturally occurring biodegradation. When the rate of biodegradation in groundwater down gradient from the source equals or exceeds the rate of contaminant dissolution and transport away from the source, the solute plume will stabilize or recede. The natural biodegradation of hydrocarbons by indigenous microbes is universal and occurs to varying extents in all subsurface environments. 1,2-DCA can be biodegraded under oxic and anoxic conditions. First-order degradation rates of 0.44 to 18⁻¹ year for 1,2-DCA have been reported.

Threatened or impacted drinking water wells:

Soils encountered in onsite investigation boring SB1 consisted of interbedded gravelly silt, silt, clayey silt, sandy silt, and silty sand, to a maximum depth of approximately 70 feet bgs. In 1981, before the current building was developed, geotechnical borings determined that groundwater was present at approximately 63 feet bgs. Prior to 2001, localized depth to water for the groundwater monitoring wells was approximately 45 to 48 feet bgs. Based on a review of regional groundwater conditions measured in nearby WQARF wells, the groundwater table has lowered. This was caused primarily by the 2004 lining of the Salt River Project (SRP) Grand Canal to the south of the site, which reduced recharge to the underlying aquifer. Additionally, the dewatering system managed by OCI lowered groundwater elevations while in operation. During March 2019, the depth to on-site groundwater was approximately 67.9 feet.

The City of Phoenix (COP) Water Services Department supplies potable water to the area, and there are no City production wells within 1 mile of the LUST site. The COP operates a regulated public water system (AZ04-0725) that services the area around the LUST site. Currently the COP uses mainly surface water [Salt River Project (SRP) reservoirs and the Colorado River] as its main source of drinking water. Nearly 50% comes from the Colorado River, which may begin to have shortages as soon as 2020 according to the Bureau of Reclamation. Because of this, COP views all water within their service area boundary as a potential water supply source in the event that Colorado River allocations are curtailed during a drought declaration.

ADEQ sent SRP and COP *Water Provider Questionnaires* in November 2018 for their comments on this proposed LUST case closure. No specific objections were raised to the closure.

ADEQ completed a search was performed of the Arizona Department of Water Resources (ADWR) database for all registered groundwater wells within approximately a one-half mile radius of the LUST site. There are 198 registered wells within 1/2-mile of the Site. Of the 198 registered wells, there are three registered “exempt” wells. Well #55-640379 is located at a private residence approximately 1,000 feet southeast of the site at 71 E. Pierson Street. The well was installed in approximately 1968 to a depth of 300 feet with an unknown screen interval. ADWR records indicate that its use is for domestic and irrigation purposes. According to ETIC, based on a telephone discussion in August 2018 with the COP Water Services Department, the address 71 E. Pierson Street is connected to City water. One well owned by SRP (#55-806199) is located to the northeast of the site approximately ½ mile. This well shows as abandoned on the ADWR database. The third well (#55-482030) was registered in 2010, but the ADWR did not allow the well to be installed. Of the 24 registered “non-exempt” wells, one is located approximately ½ mile to the northeast at a private residence (on City water), an abandoned SRP well (#55-607673), and a well at Brophy College Preparatory (#55-220153) located to the southeast approximately 1/3 mile. The well is drilled to a depth of 415 feet and is screened between 360 and 380

feet. This well provides potable water to the school as part of public water system 04-07182. The well was installed in 2011 to replace well #35-800731 that rusted out, and no longer provided enough water. The ADEQ Safe Drinking Water Database shows groundwater monitoring results from May 2020 show no VOCs were detected. The Brophy well is cross gradient of monitoring well CC-20, which has been non-detect for VOCs since it was installed in early 2019.

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:

During the UST permanent closure in 1999, VOC soil contamination was discovered beneath the USTs and the dispensers at concentrations that exceeded applicable regulatory standards. Benzene, toluene, ethylbenzene, and total xylene (BTEX) concentrations in soil have decreased since 1997, when the maximum concentrations were detected. In July 1997, the benzene concentration was 250 mg/kg at 46 feet bgs; toluene was 1,300 mg/kg at 46 feet bgs; ethylbenzene was 560 mg/kg at 46 feet bgs; and total xylenes was 2,470 mg/kg at 46 feet bgs. In November 2017, soil samples were collected from borings SVP2 and SVP3 at 2 and 5 feet bgs and SB1 at 5-foot intervals between 5 feet and 70 feet bgs. VOCs historically were detected in soil at shallow depths; however much of the former service station site was excavated to 40 to 50 feet bgs during construction of the current onsite building. Direct exposure to near surface soil could occur by an onsite commercial worker or construction worker digging into soil along and in the sidewalk area on the northern and western portions of the property and planter areas along the building. Soil sample analytical results from SVP2 and SVP3, and SB1 at 2 and 5 feet bgs in 2018 indicate that fuel constituents do not exist above the laboratory reporting limits. The tetraethyl lead (TEL) concentrations reported at locations SVP2 and SVP3 were below the method reporting limits which are below the non-residential Soil Remediation Level, but above the residential Soil Remediation Level (rSRL). Maximum current concentrations of adsorbed-phase VOCs that exceed applicable regulatory standards in SB-1 are benzene, 1, 2, 4-trimethylbenzene, and 1, 3, 5-trimethylbenzene (TMBs) at 70 feet bgs. TEL was detected in SB-1 above the rSRL between 65 and 70 feet bgs, with the maximum concentration at 70 feet bgs. The TEL contamination between 65 and 70 feet bgs does not pose a dermal contact or ingestion risk. TEL is not mobile or volatile, so inhalation exposure is also not a risk.

To evaluate the inhalation pathway for the historic subsurface VOC soil contamination, a soil vapor survey was conducted on November 17, 2018. ETIC performed a risk screen using the U.S. Environmental Protection Agency (USEPA) Johnson and Ettinger Vapor Intrusion Model. The Tier 3 Risk Assessment evaluation using the Johnson and Ettinger Model indicates (for the chemicals evaluated) a “best fit” Excess Lifetime Cancer Risk (ELCR) of 7.405×10^{-7} and a Hazard Index (HI) of 2.495×10^{-2} . These calculated values are below the target ELCR of 1×10^{-6} and HI of 1, which indicates an acceptable level of vapor intrusion risk into a hypothetical, concrete slab on-grade onsite building used for residential purposes. The primary drivers to the calculated cumulative cancer risk result are the trihalomethanes (THMs), chloroform and bromodichloromethane. The presence of these constituents is likely from potable water used to irrigate the nearby planters around the building.

Currently, the site is under redevelopment from a multi-story office building to a mixed-use building with residential condominiums on the upper floors, with the underground parking remaining. Residential dwellings are located to the southeast of the site. The closest of these residences, a single-story apartment complex, is 80 feet to the southeast across North 1st Street. The soil contamination present at the Site does not pose a dermal contact, ingestion or inhalation risk to these off-site sensitive receptors, since the soil contamination is present only on site.

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 tables:

Groundwater data for MWA-09 (located in Camelback Road)

Total Depth: 80 feet. Screened interval: 55-80 feet.

Date	Benzene AWQS is 5 µg/L	Ethylbenzene AWQS is 700 µg/L	1,2-DCA AWQS is 5.0 µg/L	Depth to water (ft.)
February 2012	134	1200	<1.00	65.04
February 2013	130	1180	<1.00	65.09
December 2013	143/143/	1700/1640	21.2/20.6	65.10
March 2014	115	1690	<10.0	65.27
March 2015	83.9	1320	<10.0	65.54
June 2015	88.1/87.9	1850/1790	<10.0/<10.0	66.53
September 2015	68.9/67.1	2060/2000	12.2/11.9	66.52
December 2015	81.9/80.6	2690/2640	<10.0/<10.0	65.63
March 2016	57.5/54.9	1610/1550	10.5/9.87	66.21
May 2016	61.7/60.5	2530/2230	<10.0/<10.0	68.48
September 2016	37.2/35.6	1250/1240	11.9/11.6	67.34
December 2016	39.0	1270	<20.0	67.38
March 2017	27.7	1680	<10.0	67.28
August 2017	18.5	1350	7.70	68.11
November 2017	25	1500	<10	66.67
February 2018	25.7	1090	<10.5	67.43
May 2018	20	730	4.5	68.02
September 2018	14	1200	2.3	69.01
March 2019	12/12	40/41	96/96	67.91
November 2019/March 2020				No access due to construction

Groundwater data for MWA-10 (located in Camelback Road north of MWA-09)
Total Depth: 80 feet. Screened interval: 55-80 feet.

Date	Benzene AWQS is 5 µg/L	Ethylbenzene AWQS is 700 µg/L	1,2-DCA AWQS is 5 µg/L	Depth to water (ft.)
February 2012	286	3460	<1.00	64.88
February 2013	131	1170	<1.00	65.17
March 2014	74.8	1920	<10.0	65.46
June 2014	88.8	2370	12.0	66.04
March 2015	61.2	1940	<20.0	65.85
June 2015	77.8	2100	<10.0	66.81
September 2015	60.1	1900	<1.00	66.81
December 2015	72.4	2250	<10.0	66.18
March 2016	52.5	1790	<1.00	66.55
May 2016	59.8	2750	<10.0	68.57
September 2016	41.1	1370	<1.00	67.72
December 2016	28.5	1510	<20.0	67.41
March 2017	14.0	1920	<10.0	66.94
August 2017	12.8	1530	<10.0	68.37
November 2017	9.7	1700	<10	66.68
February 2018	9.54	1200	<10	67.44
May 2018	7.0	1200	<20	68.04
September 2018	4.9	1290	<4.0	68.93
March 2019	2.5	38	42	67.86
November 2019/March 2020				No access due to construction

DW-N2 (de-watering well located near MWA-09)
Total Depth: 103 feet. Screened interval: 45-103 feet.

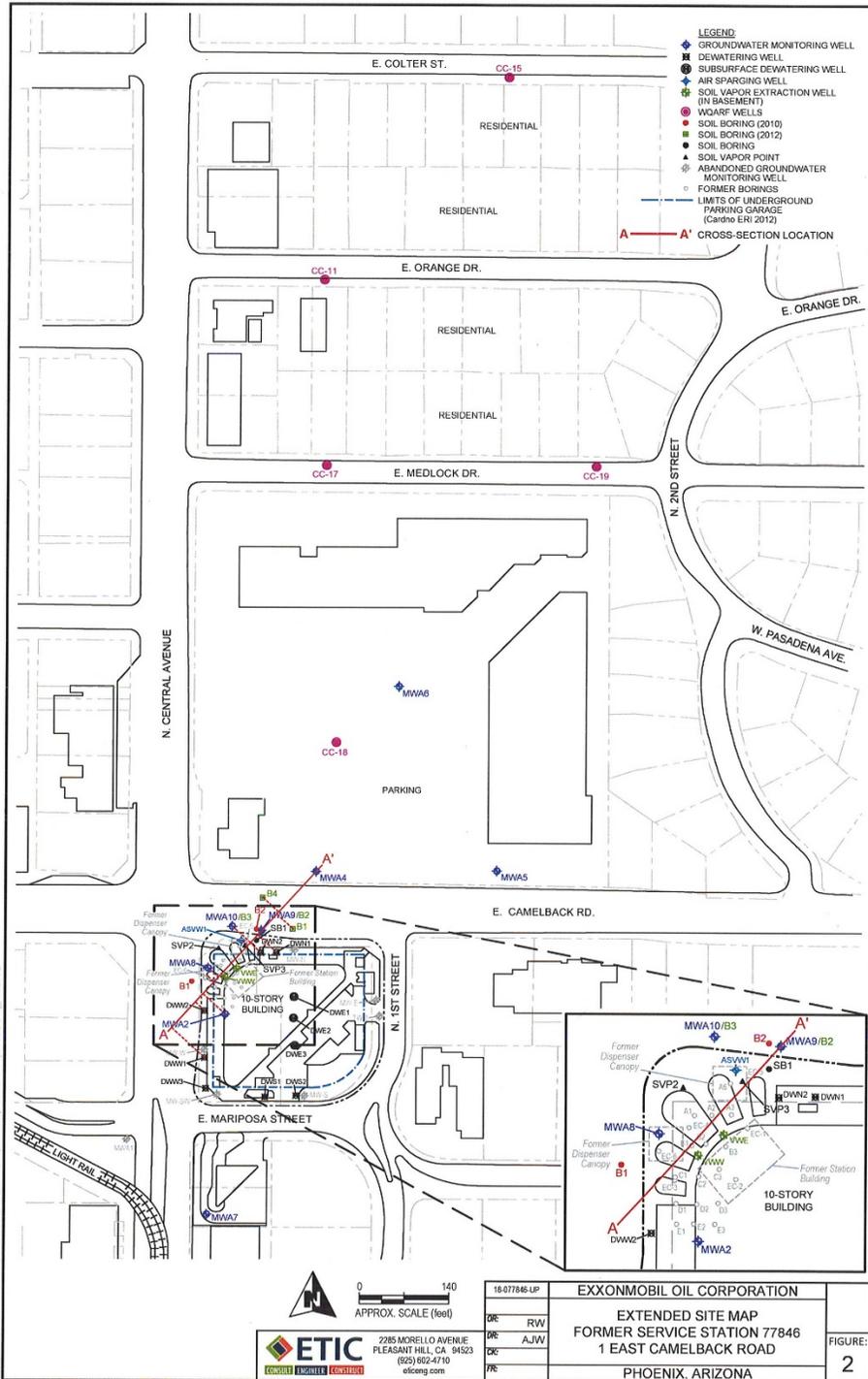
Date	Benzene AWQS is 5 µg/L	Ethylbenzene AWQS is 700 µg/L	1,2-DCA AWQS is 5 µg/L	Depth to water (ft.)
April 2017	2.5	34	4.2	72.60 (pumping level)
June 2017	2.0	16	3.6	72.01 (pumping level)
September 2018	3.9	110	4.4	Not measured
March 2019	4.2	130	3.1	Not measured
November 2019/March 2020				No access due to construction

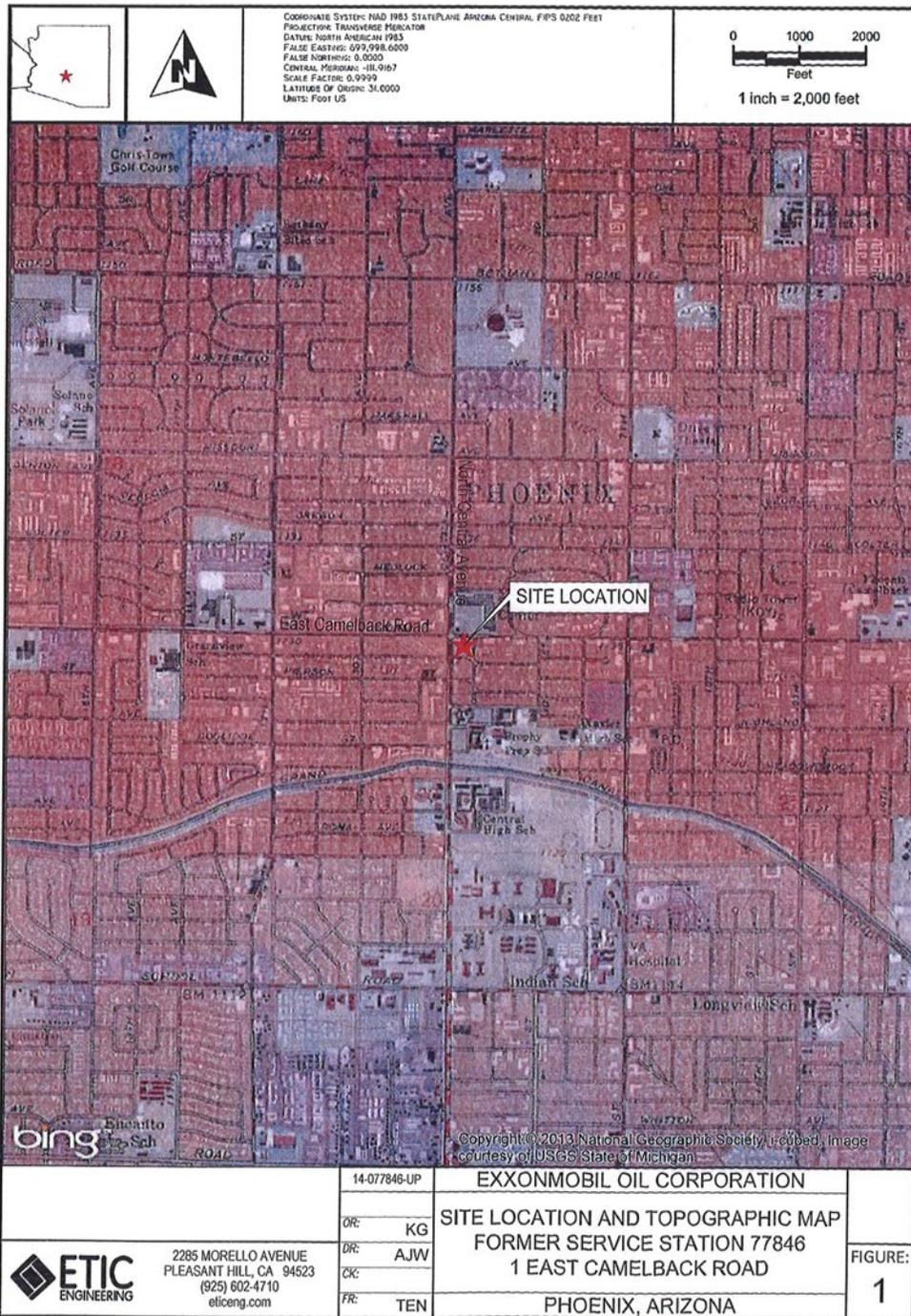
CC-20 (WQARF well to the southeast of site installed 2019)
Total Depth: 113 feet. Screened interval: 58-108 feet.

Date	Benzene AWQS is 5 µg/L	Ethylbenzene AWQS is 700 µg/L	1,2-DCA AWQS is 5 µg/L	Depth to water (ft.)
April 2019	<0.50	<0.50	<0.50	67.65
November 2019	<1	<1	<1	68.13
March 2020	<1	<1	<1	68.81

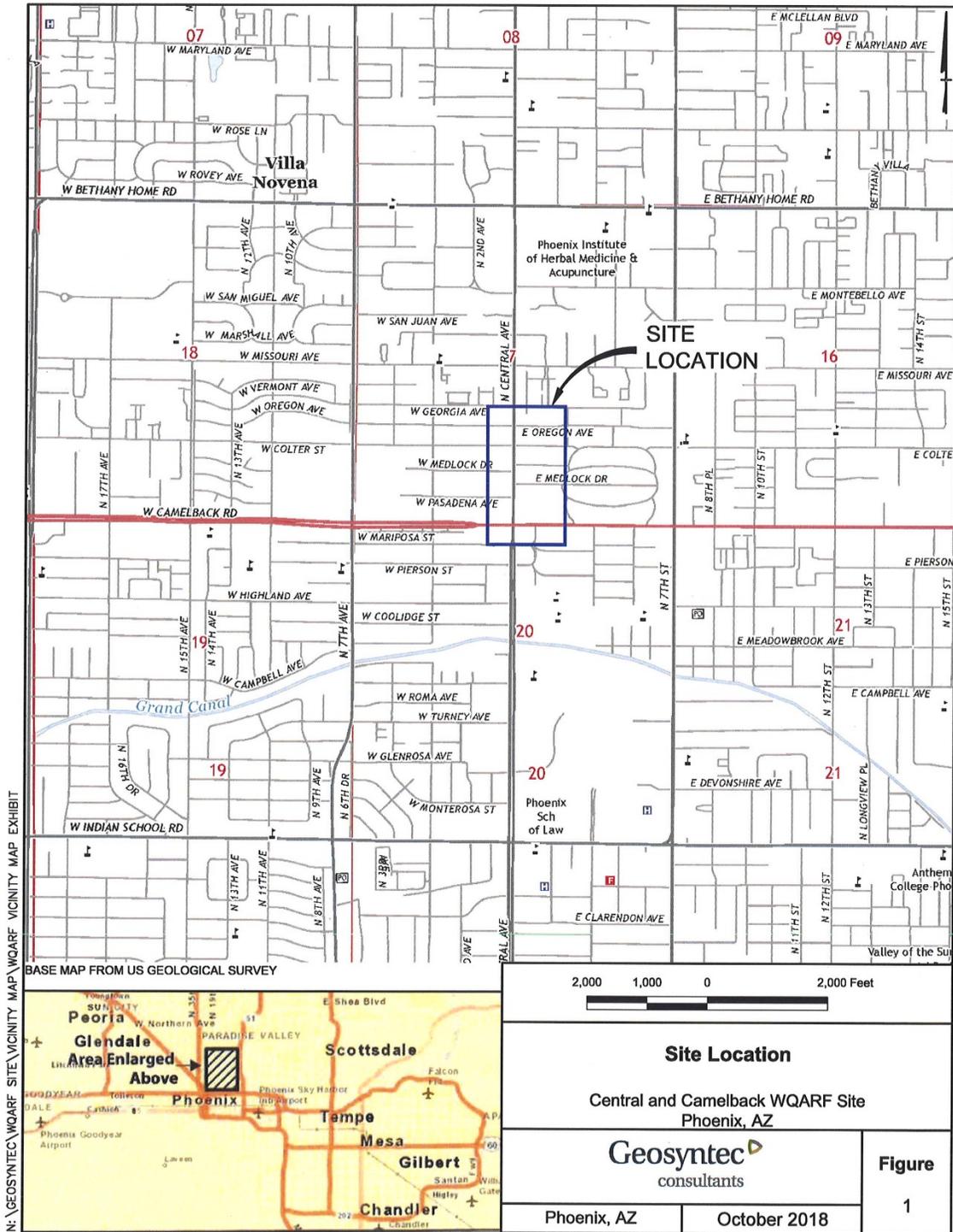
CC-21 (WQARF well to the south of site installed 2019)
Total Depth: 93 feet. Screened interval: 88-93 feet.

Date	Benzene AWQS is 5 µg/L	Ethylbenzene AWQS is 700 µg/L	1,2-DCA AWQS is 5 µg/L	Depth to water (ft.)
April 2019	<0.50	<0.50	<0.50	66.74
November 2019	<1	<1	<1	67.25
March 2020	<1	<1	<1	67.78

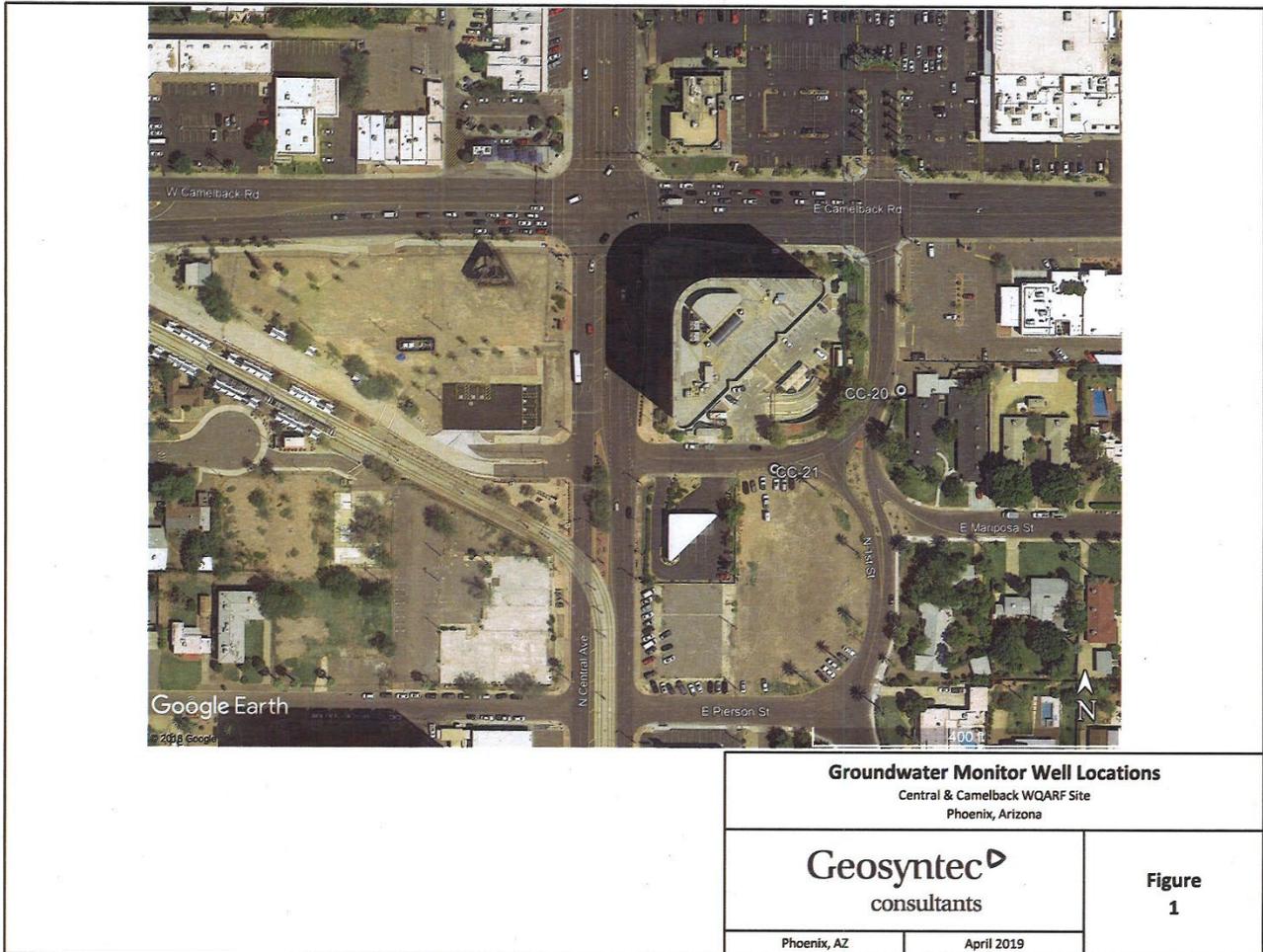


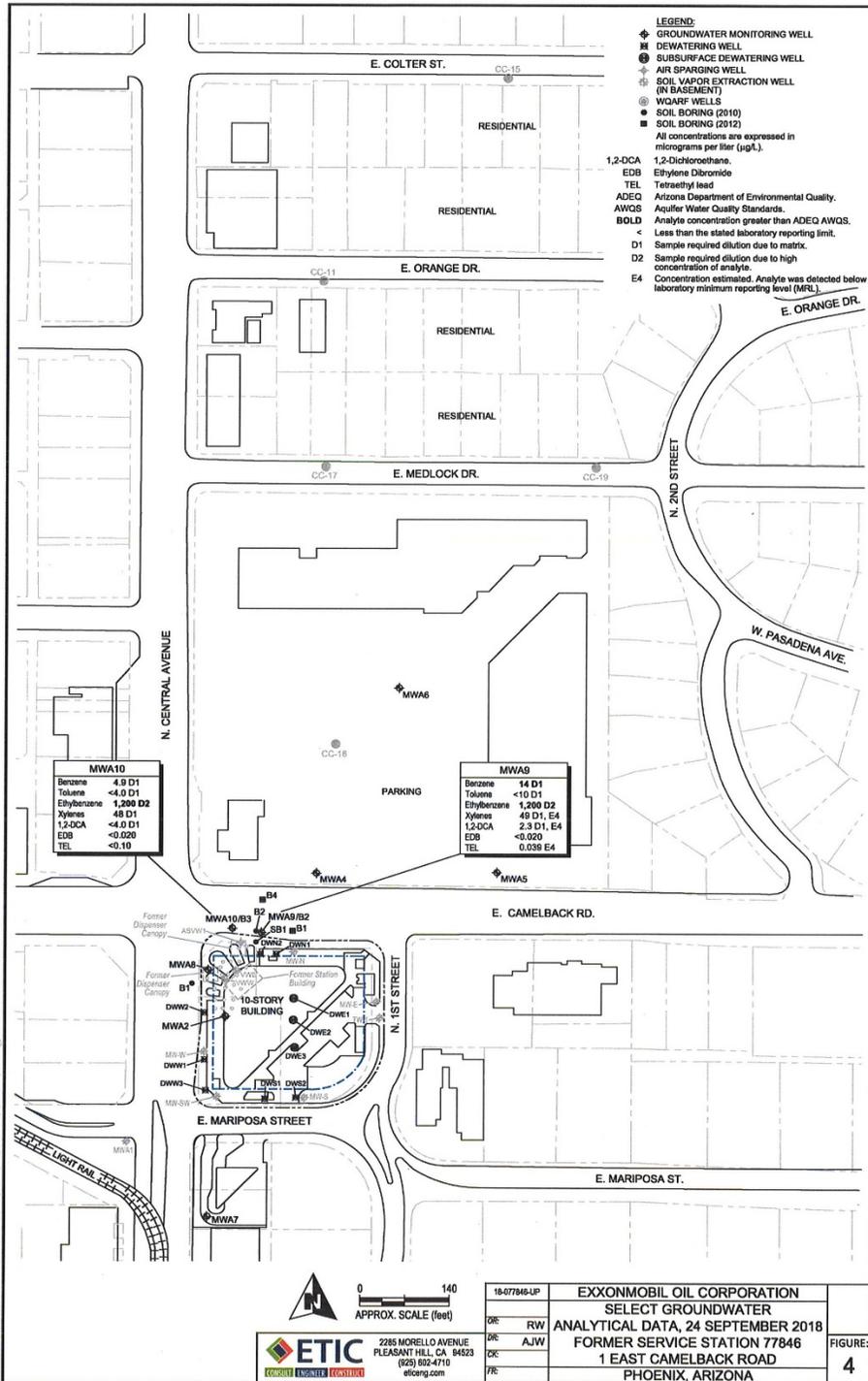


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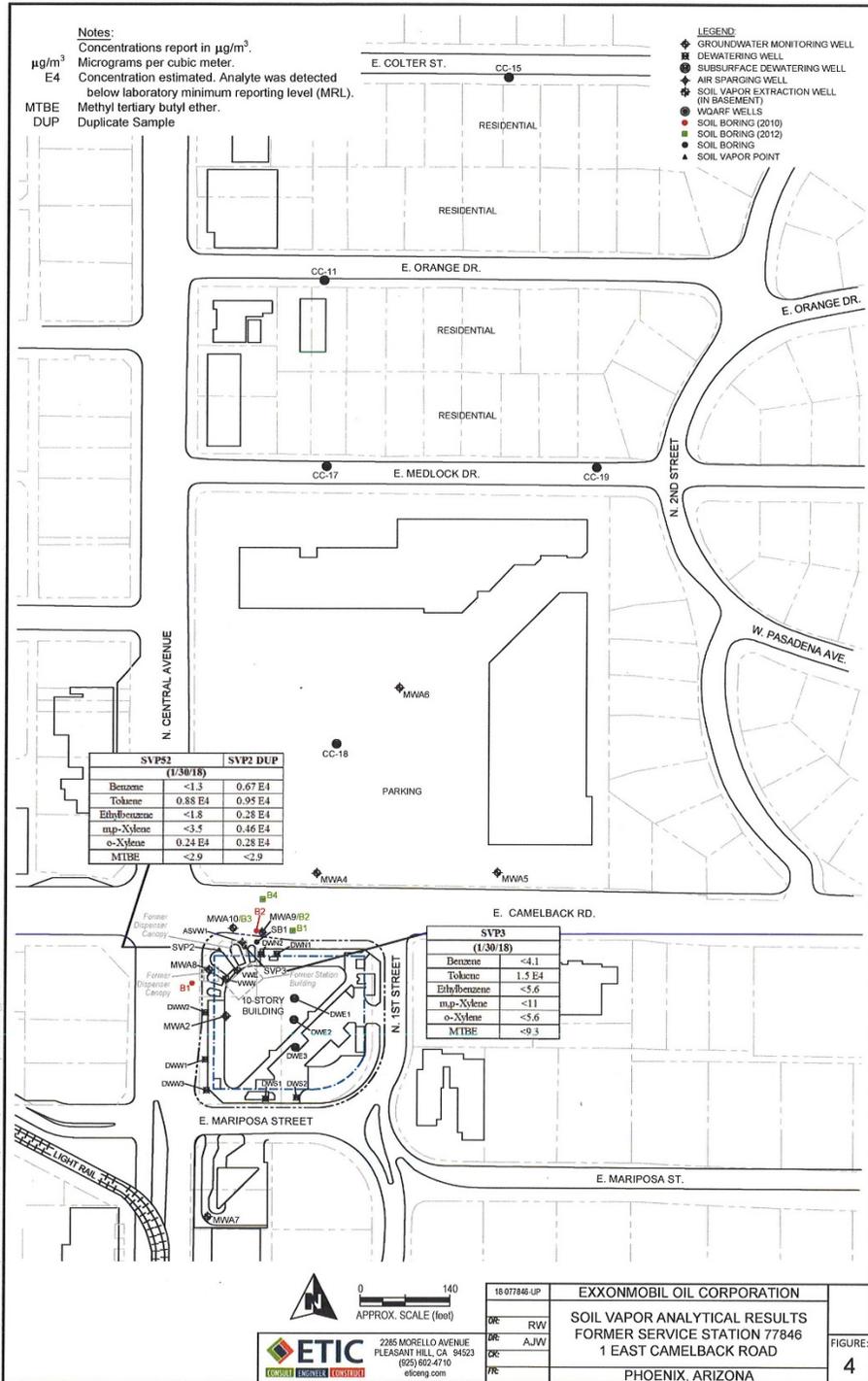




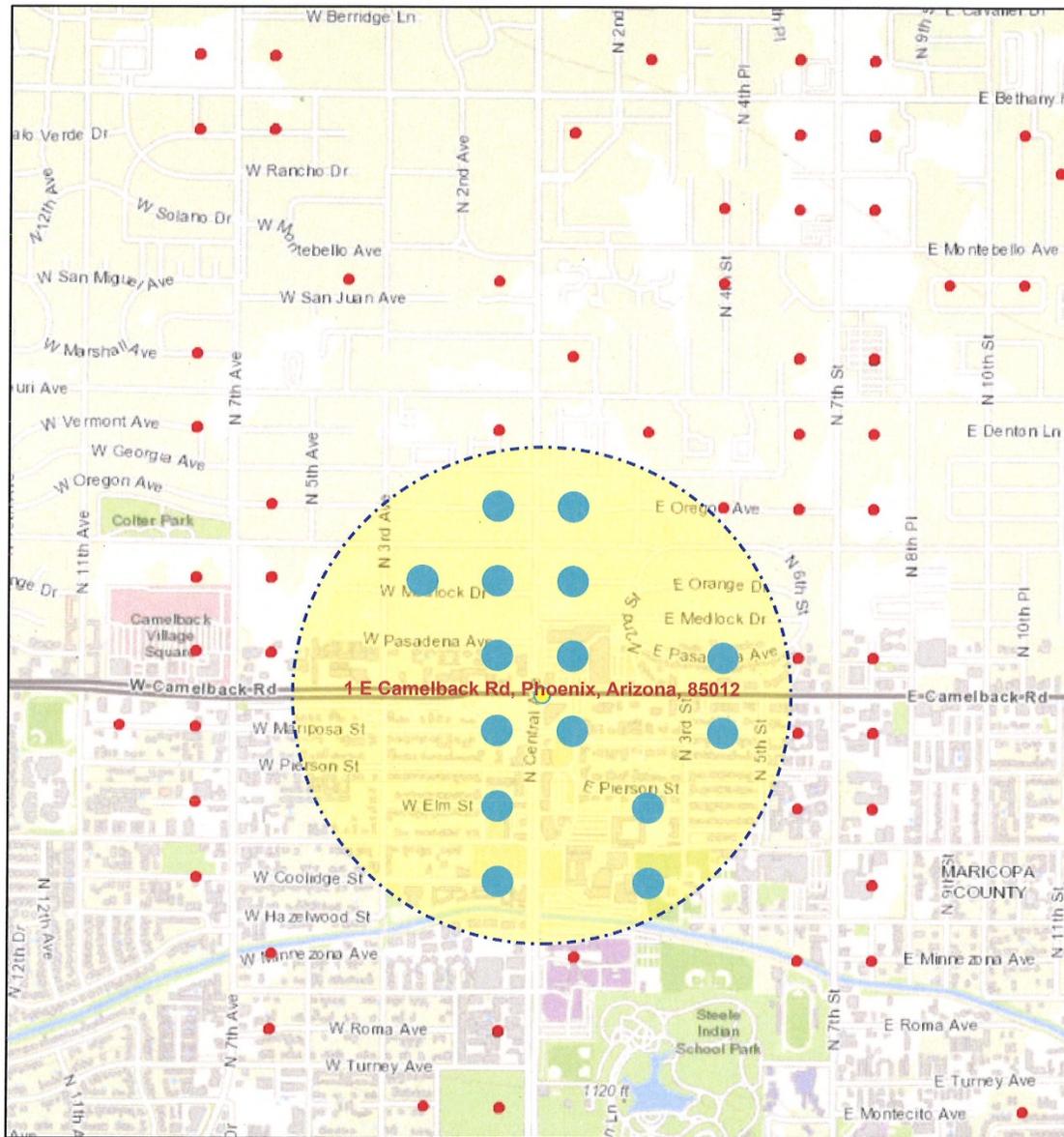




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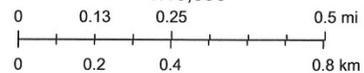


Former Service Station 77846



January 30, 2019

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