ADEQ Arizona Department of Environmental Quality

TECHNICAL SUPPORT DOCUMENT

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

LUST Case File # 2184.01
Facility ID # 0-006057
Maricopa County

Road Markings Inc. (former Douglas Insulation)
1850 East Encanto Drive
Tempe, Arizona 85281

Background:
The Site is located at 1850 East Encanto Drive in Tempe, Arizona. In 1978 Douglas Insulation, Inc. installed a 10,000-gallon gasoline UST. The release was discovered during the removal of the UST in 1992 and site characterization activities conducted in 1993 indicated that the contamination reached groundwater. Lithology is reported to be primarily consisting of coarse-grained alluvial deposits of mixtures of gravel, sand, and cobbles with minor silt and clay. ADEQ subsequently issued leaking underground storage tank [LUST] File number is 2184.01. During the investigation, it was also determined that the groundwater contamination migrated down gradient toward the south to an off-site commercial property located at 1868 East Broadway Road.

Initially the responsible party (RP) performed soil vapor extraction (SVE) using one extraction well from 1995 to 1996. From 1992 to 2003, site characterization activities were also conducted by the RP.

ADEQ's State Lead Unit began performing corrective actions at the site in 2003, which is detailed in the subsequent section of this document. The State Lead contractor Wood Environmental & Infrastructure Solutions, Inc. (Wood) submitted a *Corrective Action Completion Report, Former Douglas Insulation Facility,* dated November 13, 2020.

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 Aquifer Water Quality Standards (AWQS) or Tier 1 Corrective Action Standards.

Removal or control of the source of contamination:
Source control has been completed by the UST system being permanently removed in February 1992. During the excavation, evidence of a release was observed. The total volume and timeframe of the release is unknown. The UST system has been removed, which has removed the source of VOCs to the soil and groundwater.

In 1994, a SVE well was also installed to perform a pilot test. The pilot test indicated that SVE would be a feasible remedial technology for vadose zone remediation. During 1995 and 1996, SVE was implemented at the Site using VEW-1 as a sole extraction well. The SVE system was shut off after VOC concentrations in the extracted soil gas had been significantly reduced. Subsequent soil sampling results from MW-3 confirmed that soil was successfully remediated. However, since the time SVE was discontinued at the Site the water table declined, exposing what had been a submerged non-aqueous phase liquid plume.

An SVE system with a thermal oxidizer was started in 2003 and the air sparge (AS) system was started in April 2004. The oxidizer was shut down in November 2005 following very low influent SVE concentrations and extraction rate. Between November 2005 and September 2007, the AS system had a run time of approximately 67.2 percent. Based on information contained in the ADEQ LUST file, the SVE system removed an estimated 197,205.51 pounds of volatile fuel hydrocarbons.

Three (3) rounds of in-situ chemical oxidation (ISCO) were also performed by gravity feeding with low-concentration hydrogen peroxide in October 2005, December 2005, and March 2006. In addition, two rounds of chemical injections were performed by gravity feeding with low concentration of Klozur® (Sodium Persulfate) in wells RW-1 and MW-12. Totals of 730 gallons and 500 gallons of Klozur® were injected in June 2006 and July 2006, respectively. As indicated by increased benzene and total VOC concentrations following the injections, the groundwater analytical data collected on September 7, 2006 and on February 21, 2007 indicate the chemical injections were not effective at MW-12.

Confirmatory soil sampling performed in 2008 showed that no further soil remediation would be necessary. The groundwater sampling results also showed the on-site dissolved contaminant concentration was significantly reduced. However, 2010 sampling showed that off-site groundwater contamination remained at levels of approximately 6,800 µg/L benzene.

During June 2011, an SVE and AS system was installed at the off-site property to clean up the remaining groundwater plume. The groundwater during this time was 60 feet below ground surface (bgs). After several months of operation, State Lead determined that the system was not producing the desired results.

Depth-specific sampling at various depths of the highest contaminated off-site well was performed to investigate why the system was not as effective as predicted. It was determined that the contamination extended at least to the bottom of this well (125 feet bgs). As a result, the SVE/AS system was decommissioned in January 2012. Additional vertical characterization of the off-site groundwater plume was performed and it was determined that the plume extended 90 feet below the groundwater table.

In June 2013, an ART™ system was installed. The ART™ system is also referred to as In-Well Air Stripping (IWAS). The ART™ system combines AS and IWAS to remove dissolved VOCs from the groundwater and to deliver air to the saturated zone with the intent of promoting biodegradation of the contaminants. The dissolved contaminant concentrations reduced significantly during the first four months from 27,000 µg/L benzene in July 2013 to 13,000 µg/L benzene in December 2013 at the most contaminated depth. During the first four months of operation (August 2013 to December 2013), the ART™ system resulted in decreased dissolved VOC concentrations and apparent decreased contaminant mass. However, declining water levels and apparent re-contamination from up gradient and sorbed phase sources decreased the effectiveness of the ART™ system in decreasing VOC concentrations and mass. The declining water table resulted in a decreased pumping rate that apparently affected development of the dynamic circulation pattern. At the lower pumping rate, groundwater flow would have been primarily horizontal, which resulted in an approximate 10-foot-thick vertical zone around the pump intake being remediated. This was indicated by decreasing VOC concentrations in samples collected from the pump discharges. Additionally, biologic activity apparently did not increase as indicated by bacterial testing. Therefore, in order to expedite remediation, the ART™ system was shut down in January 2015.

To continue aggressive remediation at the site, thirteen ISCO injections were performed utilizing a sodium persulfate compound (PersulfOx™) in both groundwater monitoring wells and ART™ wells between 2014 and 2020.

The remediation has removed sufficient contaminant mass from the source and off-Site portion of the plume to limit the residual benzene above 5.0 µg/L to the area of off-Site well ART-1 and the residual MTBE above 94 µg/L to the area of on-Site well RW-1.

Characterization of the groundwater plume:
On-site groundwater monitoring wells were installed beginning in 1993. Several monitoring wells were installed at the Site in 1999 and 2004 to characterize groundwater contamination. Prior to the activities performed at the Site from 2011 to present, the Site had 14 wells (MW-1 through MW-10, MW-11S, MW-11D, MW-12, and RW-1). Of these wells, MW-6, MW-7, MW-10, MW-11S, MW-11D, and MW-12 were installed offsite. On-Site monitoring wells MW-2, MW-3, MW-5, and RW-1 have been sporadically sampled since 2010.

Since the February 2018 sampling event, groundwater samples collected from wells that were used for ISCO treatments have been detected with non-site-specific VOCs such as acetone, chloroethane, chloromethane, and iodomethane that are apparently associated with the PersulfOx™ or the City of Tempe water that is being used to mix the chemicals. These VOCs do not have Tier 1 levels and are not considered COCs. Trihalomethanes that include chloroform, bromoform, and chlorodibromomethane have also been detected Tier 1 level of 100 µg/L for total trihalomethanes in samples from wells that have been treated with PersulfOx™.

MTBE and benzene are the only VOCs recently detected above applicable Tier 1 Corrective Action Standards or AWQS. Groundwater sampling was conducted on July 23, 2020 and October 12, 2020 to evaluate benzene and MTBE concentration trends. The groundwater samples were analyzed for VOCs by Environmental Protection Agency (EPA) Method 8260B. Consistent with the previous sampling events, depth-specific groundwater samples were collected from the following wells and depths using the Hydrasleeve™ method; MW-2 (95), MW-3 (95), MW-5 (95), RW-1 (90), MW-12 (95), MW-13 (95, 130), ART-1 (95, 130), and ART-2 (105, 130).

Based on the October 12, 2020 analytical results, MTBE concentrations above 94 µg/L is currently limited to the area of on-Site well RW-1. Based on the October 12, 2020 groundwater sample results, benzene is currently below the AWQS of 5.0 µg/L in the on-Site wells, ranging from 0.19 µg/L (MW-5) to 1.7 µg/L (MW-3). Off-Site wells MW-12, ART-1, and ART-2 are located mid-plume.

Benzene was reported at a maximum concentration of 27,000 µg/L in sample MW-12-85 collected on July 10, 2013. Benzene was above the AWQS in depth-specific samples collected from MW-12/ART-2 from 60 to 140 ft., a thickness of 80 ft. The furthest down gradient well reported with benzene above the Tier 1 level of 5.0 µg/L is off-Site well MW-13. Based on the October 12, 2020 groundwater sample analytical results, the benzene plume is currently limited to the area of off-Site well ART-1 at a depth of 130 ft. Benzene had not been reported above 5.0 µg/L in samples collected from ART-1 since April 2018, which was prior to ISCO treatment 11. Therefore, the residual benzene reported in the October 12, 2020 sample originated from the area below Encanto Drive. Benzene was reported below the AWQS of 5.0 µg/L in the other groundwater samples collected on October 28, 2020.

MW-11S is the furthest shallow down gradient monitoring well. Twelve samples were collected from MW-11S from December 2010 to June 2019. MTBE was last reported above 94 µg/L in the sample collected on December 12, 2013 (320 µg/L). MTBE was below 94 µg/L in samples collected in March 2014, June 2014, November 2015, and June 2019, ranging from 8.8 to 14 µg/L. MW-11D, which is the furthest down gradient deep monitoring well, was only sampled in August 2012. MTBE was reported at a maximum concentration of 8.1 µg/L. Benzene concentrations have been below 5.0 µg/L, ranging from non-detect (<0.50 µg/L) to 0.58 µg/L. MW-11D, which is the furthest down gradient deep monitoring

well, was only sampled in August 2012. Benzene was not detected (<0.50 µg/L). The MTBE and benzene plume is characterized in the down gradient direction

Groundwater plume stability:
Monitoring wells associated with the on-Site portion of the groundwater contamination are MW-2, MW-3, MW-5, and RW-1. The off-Site portion of the groundwater impact includes Encanto Drive to the south and the Hypertec facility, located south of Encanto Drive. The only off-Site well that is impacted is ART-1. The furthest up gradient monitoring well available for sampling is on-Site well MW-3 and the furthest down gradient wells available for sampling are off-Site wells MW-11S and MW-11D. The distance between these wells is 830 ft. The historical maximum aerial extent of the benzene plume was 500 ft. long and more than 200 ft. wide, based on the groundwater monitoring well data.

Based on the October 12, 2020 analytical results, MTBE concentrations above 94 µg/L is currently limited to the area of on-Site well RW-1, and benzene is currently below the AWQS of 5.0 µg/L in the on-Site wells, ranging from 0.19 µg/L (MW-5) to 1.7 µg/L (MW-3). At RW-1, MTBE concentrations were elevated in May (310 µg/L) and July 2020 (340 µg/L) but declined to 140 µg/L in October 2020. RW-1 is located down gradient of MW-2 and MW-3. ISCO treatments were performed in January 2020 at MW-2 and MW-3 and MTBE concentrations at MW- 2 and MW-3 are both declining. MTBE is relatively stable at this location and is anticipated to attenuate naturally at RW-1.

The last three detections at ART-1 (120 ft. bmp) were below the AWQS and benzene was detected at a concentration of 160 µg/L in April 2018 which was the highest detection since October 2016 (360 µg/L). An ISCO injection was performed following this elevated benzene detection in July 2018 and concentrations declined over the next three monitoring events. Benzene detections in ART-1 at the 130 ft. bmp sample location have been below the AWQS in the last five monitoring events. The most recent detection was not consistent with detections at this depth and represents a rebound detection post ISCO treatment or an anomalous detection.

The benzene concentration in ART-1 between 85 and 120 feet is below laboratory detection limits. The benzene concentration in ART-1 between 135 and 140 feet is below AWQS. Benzene concentrations have been below laboratory detection limits in down-gradient MW-13 for the last eight sampling events at 130 feet.

As part of a more detailed assessment of the stability of the residual plume, a statistical analysis (Mann-Kendall) of contaminant concentration trends was performed for specific wells sampled throughout 2019-2020. Additional wells were not included since most of the data was reported as non-detect for several years.

Trends at locations near the source area that continue to exhibit benzene and/or MTBE concentrations above the AWQS or Tier 1 Corrective Action Standard indicate an overall stability and decline from original concentrations, as presented later in the groundwater data tables.

Well ID	Benzene - AWQS of 5 µg/L						MTBE – Tier 1 Risk Level of 94 µg/L					
	Mean (µg/L)	σ (µg/L)	CV	S Statistic	Trend	CL	Mean (µg/L)	σ (µg/L)	CV	S Statistic	Trend	CL
MW-2	19.9	29.7	1.5	-8	Decreasing	≥ 90 %	233.6	158.2	0.7	-6	Decreasing	≤ 90%
MW-3	4.1	1.4	0.3	2	No Trend	≤ 90%	120.8	138.5	1.2	-6	Decreasing	≤ 90%
RW-1	37.2	47.2	1.3	-13	Decreasing	≥ 90 %	140.9	121.0	0.86	11	Increasing[1]	≥ 90 %
ART-1 (120 ft bmp)	40.5	69.0	1.3	-3	No Trend	≤ 90%	8.9	14.5	1.6	-3	No Trend	≤ 90%
ART-1 (130 ft bmp)	4.0	8.1	2.0	2	No Trend	≤ 90%	0.48	0.03	0.07	4	No Trend	≤ 90%

Notes:
Increasing trend identified by Mann-Kendall test
Decreasing trend identified by Mann-Kendall test
No trend identified by Mann-Kendall test
CV is less than 1 and data set is considered stable
[1] – Increasing trend is affected by two outlying data points
≥ - greater than
≤ - less than
bmp – below measuring point
CL - confidence level
CV - Coefficient of variance
ft - feet
σ - standard deviation
ID - Identification
µg/L - micrograms per liter

Natural Attenuation:
Natural attenuation processes include diffusion, dispersion, sorption, volatilization, and biodegradation. As previously indicated, thirteen PersulfOx™ treatments were applied to Site monitoring wells, with the thirteenth performed during January 2020. The influence of PersulfOx™ is indicated by increased oxidation- reduction potential (ORP) to strongly oxidizing levels compared to baseline. There is also an increase in dissolved oxygen (DO) immediately following the treatment; however, the DO concentrations should decrease as the reactive DO is converted to water and carbon dioxide as the VOCs are oxidized. This occurs while ORP remains strongly positive (>100 mV). According to Regenesis, PersulfOx™ may remain reactive for up to 90 days after a treatment. If a treated well returns to pre-treatment conditions, then the PersulfOx™ is indicated to be completely spent and is no longer reacting with the VOCs. Conversely, elevated DO and ORP following a treatment indicate that the VOC concentrations are likely too low to sustain oxidation, which is confirmed by analytical results. It should be noted that the presence of a chemical oxidant can result in false DO readings in excess of the oxygen saturation limit in water, approximately 8.0 mg/L. Electroconductivity and total dissolved solids increase after an injection and are used to measure the persistence of persulfate.

According to Regenesis, PersulfOx™ also does not kill petroleum-degrading bacteria; however, the bacteria, if present, will go into a state of inactivity. Regenesis has observed that petroleum-degrading bacteria, if present, may reactivate between 6 and 12 months after a treatment if conditions are suitable. If DO and ORP are indicative of aerobic conditions and dissolved VOCs are present, aerobic petroleum-degrading bacteria may become active. DO concentrations are used to estimate the mass of contaminant that can be biodegraded by aerobic processes. Each 1.0 mg/L of DO consumed by microbes may biodegrade approximately 320 µg/L of BTEX, according to published literature [Wiedemeier, et al, 1995]. If conditions become anaerobic, the anaerobic bacteria may become active.

For the purposes of Site closure by 263.04, collection of DO and ORP data is not intended to measure performance of an ISCO treatment. DO and ORP are collected to evaluate natural attenuation of benzene and MTBE. DO and ORP data since June 2019. Natural attenuation parameters nitrate, sulfate, ferrous iron, and methane were collected from selected wells on June 6, 2017. Due to elevated sulfate

concentrations resulting from the PersulfOx™ injections, sulfate is not a good indicator of natural attenuation.

The BIOSCREEN Natural Attenuation Decision Support System developed by the Air Force Center for Environmental Excellence (AFCEE) was used to evaluate natural attenuation. The BIOSCREEN model requires input of field analytical data and aquifer characteristics. DO, which is a key indicator of ISCO performance and natural attenuation, was measured during each groundwater-monitoring event. Nitrate, sulfate, ferrous iron, and methane data was collected during the June 6, 2017 monitoring event. Sulfate was non-detect (<2.0 mg/L) in sample RW-1, which was considered the background sample at that time. Due to the PersulfOx™ treatments, sulfate concentrations were elevated in the samples collected from off-Site wells MW-12-95 (15,000 mg/L), ART-5-95 (1,500 mg/L), and ART-4-95 (120 mg/L). Therefore, the delta sulfate value was entered as zero in the BIOSCREEN models.

A simulation time of five years was used. MTBE concentrations would decrease to below 94 µg/L in less than five years. Based on no degradation and first-order decay models, the dissolved MTBE plume above 94 µg/L will not extend more than 20 ft. down gradient of RW-1, which matches the field data. Benzene was also modeled (no degradation and first order decay) to be below 5.0 µg/L in less than 5 years and will not extend more than 20 ft. down gradient of ART-1, which matches the field data.

Threatened or impacted drinking water wells:
The City of Tempe (COT) supplies water to the area. There are no City production wells within 1 mile of the LUST site. The COT operates a regulated public water system (AZ0407100) that services the area around the LUST site. In 2019, the drinking water in Tempe was produced at 2 conventional surface water treatment plants and 10 groundwater wells. In 2019, Tempe used 10 groundwater wells to supplement the supplies of Salt River Project water and Central Arizona Project water. Roughly, 3.1 billion gallons (an average of 8.4 million gallons per day) of water was pumped from wells, which was comprised of groundwater and surface water previously stored underground in our aquifers. This supply made up 20 percent of water used in Tempe in 2019. Tempe's SRP water use for 2019 was 11.2 billion gallons (an average of 30.8 million gallons per day). This supply made up 72 percent of the water used in Tempe in 2019. Tempe used 1.1 billion gallons (an average of 3.0 million gallons per day) of Colorado River water delivered by CAP for potable municipal use. This supply made up 7 percent of the water used in Tempe in 2019. In 2019, Tempe utilized 0.15 billion gallons (an average of 0.41 million gallons per day) of Salt River surface water stored in Tempe's capacity behind the Modified Roosevelt Dam New Conservation Space. This supply made up 1 percent of the water supplied to Tempe's potable system.

On November 25, 2019, Wood performed a survey of potential receptors located with 0.50 miles of MW-13. A search of ADWR records on March 5, 2020 identified 27 wells not associated with the Site within the search radius. The registered wells are identified as monitoring or remediation wells associated with nearby LUST sites and the South Indian Bend Wash (SIBW) study area portion of the IBW National Priorities List (NPL) site. Most of these wells are identified as abandoned or not installed.

The SIBW study area boundary encompasses approximately four-square miles in Tempe, Arizona. The SIBW study area is bounded by Apache Boulevard on the south, Rural/Scottsdale Road on the west, Price Road on the east, and proximate to Curry Road (Salt River) on the north. The current contaminants of concern in groundwater include VOCs, cyanides, acids and heavy metals (chromium and lead). However, current information indicates there are two plume areas. The first area is located approximately 0.7 miles southwest of the Site. The second area is located approximately 0.9 miles northeast of the Site.

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:
Other exposure pathways include exposure to hydrocarbon constituents through dermal contact, ingestion of soils, or inhalation of vapors through vapor intrusion. Based on the results of confirmatory soil sampling performed by ATC in August 2008, analyzed VOCs and PAHs are not present above laboratory reporting limits and residential SRLs in the vadose zone soils. Therefore, these exposure pathways are incomplete.

No irrigation wells were identified within a 0.5-mile radius of the site based on the ADWR database. Therefore, there are no threatened or impacted irrigation wells within the 0.50-mile search radius. The nearest surface water body is the Salt River, which is located approximately 1.7 miles north and up gradient of the Site. Therefore, the Salt River is not threatened.

A search for sensitive receptors (e.g., a hospital, school, or daycare) within a 0.5-mile radius was performed. No sensitive receptors were identified.

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:

Groundwater data for RW-1 (on site)
Total Depth: 120 feet. Screened interval: 65-120 feet.

Date	**Benzene AWQS is 5 µg/L**	**MTBE Tier 1 Corrective Action Standard is 94 µg/L**	**Depth to water (ft.) Depth Specific***
12/28/2010	<2.0	67	62-65
9/15/2011	<1.0	13	59-62
12/15/2011	<0.50	530	75-78
2012-2018			Not sampled
6/11/2019	**28**	52	90*
9/17/2019	**120**	42	95*
11/6/2019	**100**	40	92*
4/2/2020	**8.0**	62	92*
5/21/2020	<0.50	**310**	90*
7/23/2020	3.2	**340**	92*
10/12/2020	0.7	**140**	90*

Groundwater data for MW-2 (up gradient of RW-1)
Total Depth: 130 feet. Screened interval: 60-130 feet.

Date	Benzene AWQS is 5 µg/L	MTBE Tier 1 Corrective Action Standard is 94 µg/L	Depth to water (ft.) Depth Specific*
12/28/2010	3.4	**1000**	62-65
12/10/2013	1.0	93	75
2014-2018			Not sampled
11/6/2019	**79**	**530**	95*
4/2/2020	**8.9**	**200**	95*
5/21/2020	3.6	**140**	95*
7/23/2020	**6.9**	**230**	95*
10/12/2020	1.3	68	95*

Groundwater data for MW-3 (up gradient of MW-2)
Total Depth: 95 feet. Screened interval: 55-95 feet.

Date	Benzene AWQS is 5 µg/L	MTBE Tier 1 Corrective Action Standard is 94 µg/L	Depth to water (ft.) Depth Specific*
12/28/2010	<2.0	**120**	62-65
9/15/2011	<1.0	48	59-62
12/15/2011	<1.0	**190**	59-62
12/10/2013	4.5	**360**	75
2014-2019			Not sampled
4/2/2020	4.5	**360**	95*
5/21/2020	**5.2**	55	95*
7/23/2020	4.9	40	95*
10/12/2020	1.7	28	95*

Groundwater data for MW-5 (down gradient of RW-1)
Total Depth: 95 feet. Screened interval: 55-95 feet.

Date	Benzene AWQS is 5 µg/L	MTBE Tier 1 Corrective Action Standard is 94 µg/L	Depth to water (ft.) Depth Specific*
12/28/2010	<2.0	90	62-65
9/15/2011	<1.0	**190**	59-62
12/10/2013	<0.50	33	75
2014-2018			Not sampled
11/6/2019	<0.50	40	95*
4/2/2020	<0.50	2.9	95*
5/21/2020	<0.50	12	95*
7/23/2020	<0.50	24	95*
10/12/2020	<0.19	26	95*

Groundwater data for MW-12 (**off-site;** historic mid-plume)
Total Depth: 112 feet. Screened interval: 72-112 feet.

Date	Benzene AWQS is 5 µg/L	MTBE Tier 1 Corrective Action Standard is 94 µg/L	Depth to water (ft.) Depth Specific*
12/28/2010	**6800**	**1100**	61-64
12/15/2011	13000	**2700**	58-61
12/15/2011	**17000**	**Not reported**	80*
12/15/2011	**16000**	**Not reported**	85*
12/13/2013	**13000**	**890**	95*
12/4/2014	**290**	**52**	95*
11/16/2015	**480**	**150**	95*
8/23/2016	**920**	**420**	95*
10/17/2017	3.0	3.9	95*
9/18/2018	**330**	**310**	95*
1/19/2019	<0.50	<0.50	95*
6/15/2019	<0.50	<0.50	95*
11/12/2019	<0.50	<0.50	95*
4/2/2020	<0.50	<0.50	95*
5/21/2020	<0.50	<0.50	95*
7/23/2020	<0.50	<0.50	95*
10/12/2020	<1.0	<5.0	95*

Groundwater data for ART-1 (off-site)
Total Depth: 151 feet. Screened interval: 43-111/121-150 feet.

Date	Benzene AWQS is 5 µg/L	MTBE Tier 1 Corrective Action Standard is 94 µg/L	Depth to water (ft.) Depth Specific
6/13/2019	<0.50	<0.50	75
7/9/2013	**540**	**110**	85
3/24/2015	**25**	18	85
6/2/2015	**12**	20	85
6/13/2019	<0.50	<0.50	85

ART-1 at 95 feet

Date	Benzene AWQS is 5 µg/L	MTBE Tier 1 Corrective Action Standard is 94 µg/L
7/9/2013	730	120
3/25/2015	**190**	73
6/2/2015	**14**	19
2/24/2016	2.3	27
4/20/2016	<0.50	16
8/22/2016	**180**	91
10/26/2016	**480**	**140**
1/18/2017	**88**	11
3/22/2017	0.43	1.6
6/6/2017	0.66	1.9
8/29/2017	3.9	1

4/10/2018	**40**	41
7/10/2018	<0.50	<0.40
9/18/2018	1.4	<0.50
3/5/2019	<0.50	<0.50
11/6/2019	<0.50	<0.50
4/2/2020	<0.50	<0.50
5/21/2020	<0.50	<0.50
7/23/2020	<0.50	<0.50
10/12/2020	<1.0	<1.0

ART-1 at 105 feet

Date	**Benzene AWQS is 5 µg/L**	**MTBE Tier 1 Corrective Action Standard is 94 µg/L**
7/9/2013	**740**	**110**
3/25/2015	**390**	**100**
6/2/2015	**14**	15

ART-1 at 110 feet

Date	**Benzene AWQS is 5 µg/L**	**MTBE Tier 1 Corrective Action Standard is 94 µg/L**
12/10/2013	4.1	6.0
3/13/2014	**62**	14
6/23/2014	**180**	70
10/10/2014	**110**	35
1/7/2015	**11**	11
2016-2018		Not sampled
6/13/2019	1.0	0.23

ART-1 at 120 feet

Date	**Benzene AWQS is 5 µg/L**	**MTBE Tier 1 Corrective Action Standard is 94 µg/L**
3/24/2015	**7.2**	<0.50
6/2/2015	**5.6**	6.1
2/24/2016	0.13	4.3
4/20/2016	<0.50	10
8/22/2016	**160**	81
10/26/2016	**6.0**	90
1/18/2017	**18**	10
3/22/2017	**36**	1.0
6/6/2017	**8.8**	<0.50
8/29/2017	1.2	<0.50
4/10/2018	**160**	34
7/10/2018	<0.50	<0.50
9/18/2018	0.92	<0.50
3/5/2019	<0.50	<0.50

ART-1 at 130 feet

Date	Benzene AWQS is 5 µg/L	MTBE Tier 1 Corrective Action Standard is 94 µg/L
3/24/2015	**9.3**	<0.50
6/2/2015	3.0	3.4
2016-2018		Not sampled
11/6/2019	0.19	0.43
4/2/2020	0.19	0.43
5/21/2020	<0.50	<0.50
7/23/2020	<0.50	<0.50
10/12/2020	**22**	1.6

ART-1 at 135 feet

Date	Benzene AWQS is 5 µg/L	MTBE Tier 1 Corrective Action Standard is 94 µg/L
7/13/2013	**3200**	**300**
1/23/2015	3.4	0.23

ART-1 at 140 feet

Date	Benzene AWQS is 5 µg/L	MTBE Tier 1 Corrective Action Standard is 94 µg/L
7/13/2013	**15**	<0.50
1/23/2015	1.4	1.6
6/13/2019	<0.50	<0.50

Groundwater data for ART-2 (cross gradient of ART-1)
Total Depth: 155 feet. Screened Interval: 48-111/121-155 feet.
Next to MW-12

Date	Benzene AWQS is 5 µg/L	MTBE Tier 1 Corrective Action Standard is 94 µg/L	Depth Specific Sample (ft.)
6/12/2019	2.7	18	75
7/9/2013	**1200**	**410**	85
6/12/2019	2.9	<0.50	85
7/9/2013	**1400**	**410**	95
6/12/2019	4.4	0.29	95
7/9/2013	**1300**	**380**	105
6/12/2019	**32**	15	105
11/17/2019	**15**	50	105
4/2/2020	<0.50	<0.50	105
5/21/2020	<0.50	<0.50	105
7/23/2020	<0.50	<0.50	105
10/12/2020	1.5	<1.0	105
12/10/2013	3.3	1.4	110
6/23/2014	<0.50	<0.50	110
1/7/2015	<0.50	<0.50	110
3/23/2015	**2000**	**510**	120

8/23/2016	**550**	62	120
1/18/2017	1.3	<0.50	120
10/17/2017	**140**	85	120
4/10/2018	<5.0	<5.0	120
9/18/2018	7.8	<0.50	120
3/5/2019	<0.50	<0.50	120
6/12/2019	1.1	0.35	120

ART-2 at 130 feet

Date	Benzene AWQS is 5 µg/L	MTBE Tier 1 Corrective Action Standard is 94 µg/L
3/23/2015	**2000**	**520**
6/3/2015	**530**	**180**
11/17/2015	**730**	**280**
2/25/2016	1.6	<0.50
4/21/2016	**14**	<0.50
8/23/2016	**410**	18
10/26/2016	**650**	**130**
1/18/2017	0.35	<0.50
3/21/2017	0.47	<0.50
6/12/2019	0.43	<0.50
11/6/2019	**31**	44
4/2/2020	<0.50	1.2
5/21/2020	<0.50	<0.50
7/23/2020	<0.50	<0.50
10/12/2020	0.47	<1.0

ART-2

Date	Benzene AWQS is 5 µg/L	MTBE Tier 1 Corrective Action Standard is 94 µg/L	Depth Specific Sample (ft.)
7/17/2013	**340**	51	135
1/23/2015	**5.1**	0.75	135
3/23/2015	**1800**	**730**	140
11/17/2015	**550**	**130**	140
2/25/2016	0.44	<0.50	140
4/21/2016	**7.1**	<0.50	140
3/21/2017	0.37	<0.50	140
6/12/2019	0.29	<0.50	140

Groundwater data for MW-13 (down gradient of ART-1)
Total Depth: 146 feet. Screened interval: 41-146 feet.
Depth Specific Sampling at 95 feet.

Date	Benzene AWQS is 5 µg/L	MTBE Tier 1 Corrective Action Standard is 94 µg/L
7/9/2013	**9990**	**1300**
3/13/2014	**1400**	**200**
6/4/2015	**4800**	**190**
4/22/2016	**4100**	**320**
8/24/2016	**230**	**200**
1/19/2017	**300**	**180**
3/22/2017	**3100**	**510**
7/24/2017	0.37	14
8/30/2017	**190**	76
10/12/2017	**100**	**98**
2/8/2018	**5.6**	24
4/12/2018	**730**	**200**
7/10/2018	<0.50	1.6
9/20/2018	**180**	**120**
1/9/2019	<0.50	2.6
3/7/2019	<0.50	2.1
11/6/2019	0.37	38
4/2/2020	<0.50	0.63
5/21/2020	<0.50	<0.50
7/23/2020	<0.50	0.45
10/12/2020	<1.0	2.1

MW-13 at 130 feet

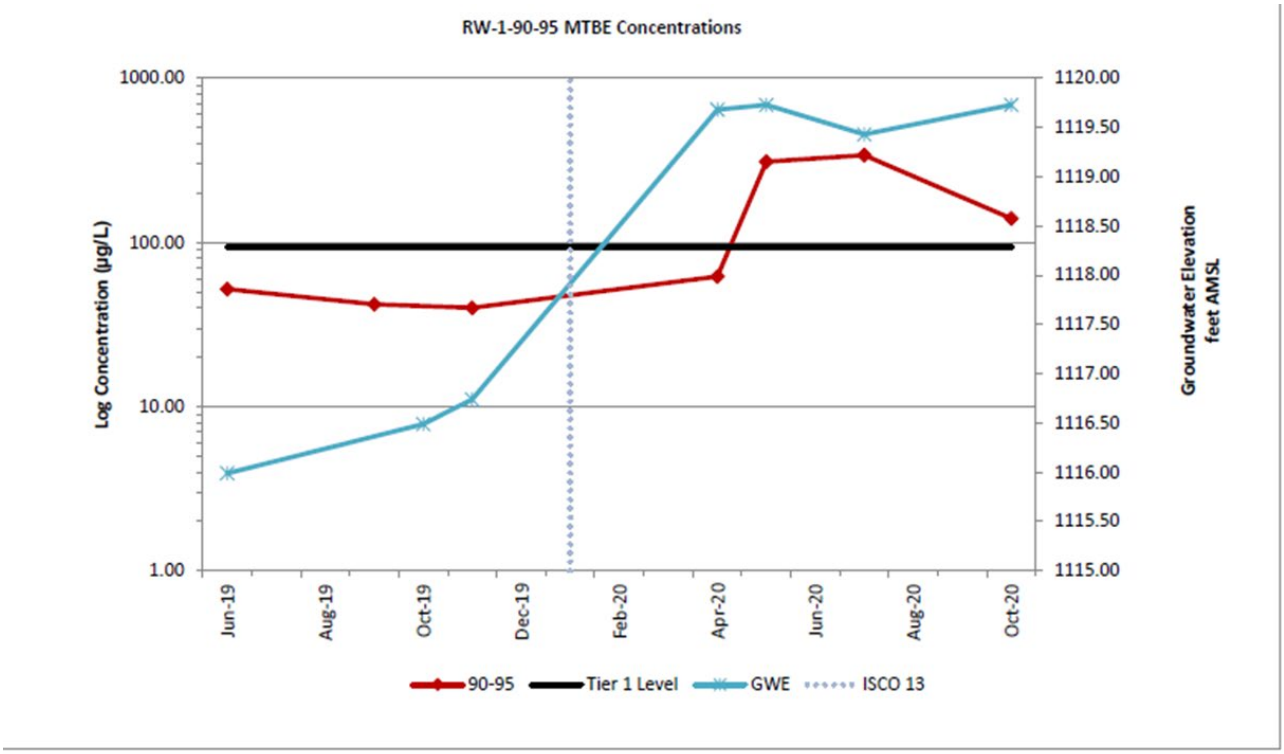
Date	Benzene AWQS is 5 µg/L	MTBE Tier 1 Corrective Action Standard is 94 µg/L
10/12/2017	**450**	**140**
2/22/2018	**34**	9.6
4/12/2018	**570**	**160**
7/10/2018	<0.50	<0.50
9/20/2018	**85**	61
1/9/2019	<0.50	<0.50
3/7/2019	<0.50	<0.50
6/13/2019	<0.50	0.79
11/6/2019	2.0	30
4/2/2020	2.0	30
5/21/2020	<0.50	<0.50
7/23/2020	<0.50	0.64
10/12/2020	<1.0	1.4

Groundwater data for MW-11S (down gradient of MW-13)
Total Depth: 110 feet. Screened interval: 45-110 feet.

Date	Benzene AWQS is 5 µg/L	MTBE Tier 1 Corrective Action Standard is 94 µg/L	Depth to water (ft.) Depth Specific Sample*
12/28/2010	<2.0	**120**	61-64
12/15/2011	<1.0	84	58-61
8/29/2012	<0.50	31	80*
8/29/2012	<0.50	47	90*
8/29/2012	<0.50	49	100*
12/9/2013	<0.50	**320**	73-76
3/13/2014	0.58	14	73-76
6/23/2014	<0.50	11	73-76
11/16/2015	<0.50	9.5	95*
6/11/2019	<0.50	8.8	95*

Groundwater data for MW-11D (down gradient of MW-13)

Date	Benzene AWQS is 5 µg/L	MTBE Tier 1 Corrective Action Standard is 94 µg/L	Depth to water (ft.) Depth Specific Sample*
8/29/2012	<0.50	0.86	120*
8/29/2012	<0.50	8.1	130*


RW-1-90-95 MTBE Concentrations
Log Concentration (µg/L)
1000.00
100.00
10.00
1.00
Groundwater Elevation feet AMSL
1120.00
1119.50
1119.00
1118.50
1118.00
1117.50
1117.00
1116.50
1116.00
1115.50
1115.00
Jun-19
Aug-19
Oct-19
Dec-19
Feb-20
Apr-20
Jun-20
Aug-20
Oct-20
90-95
Tier 1 Level
GWE
ISCO 13

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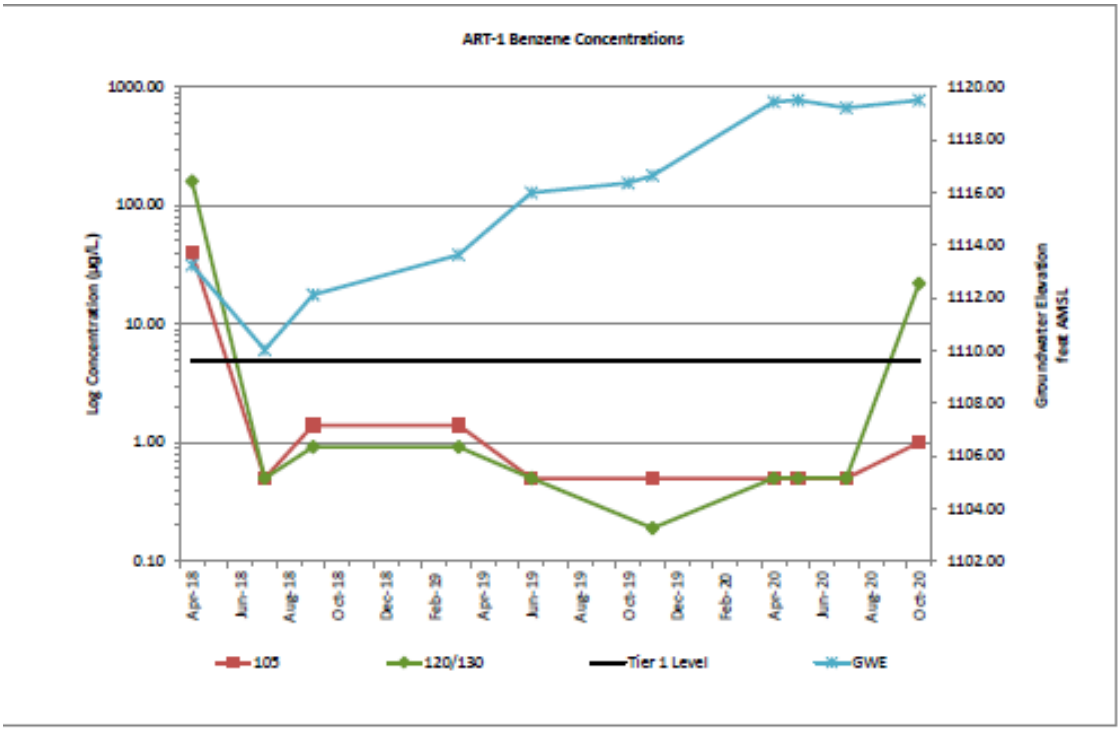
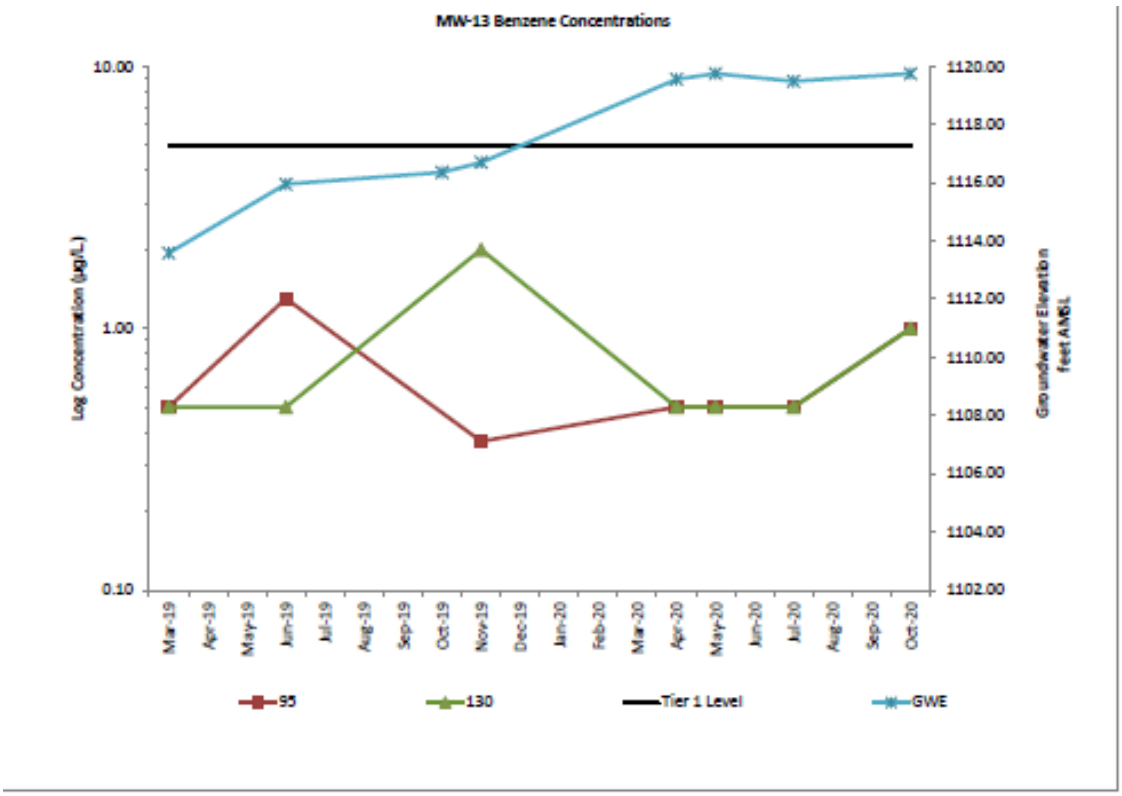
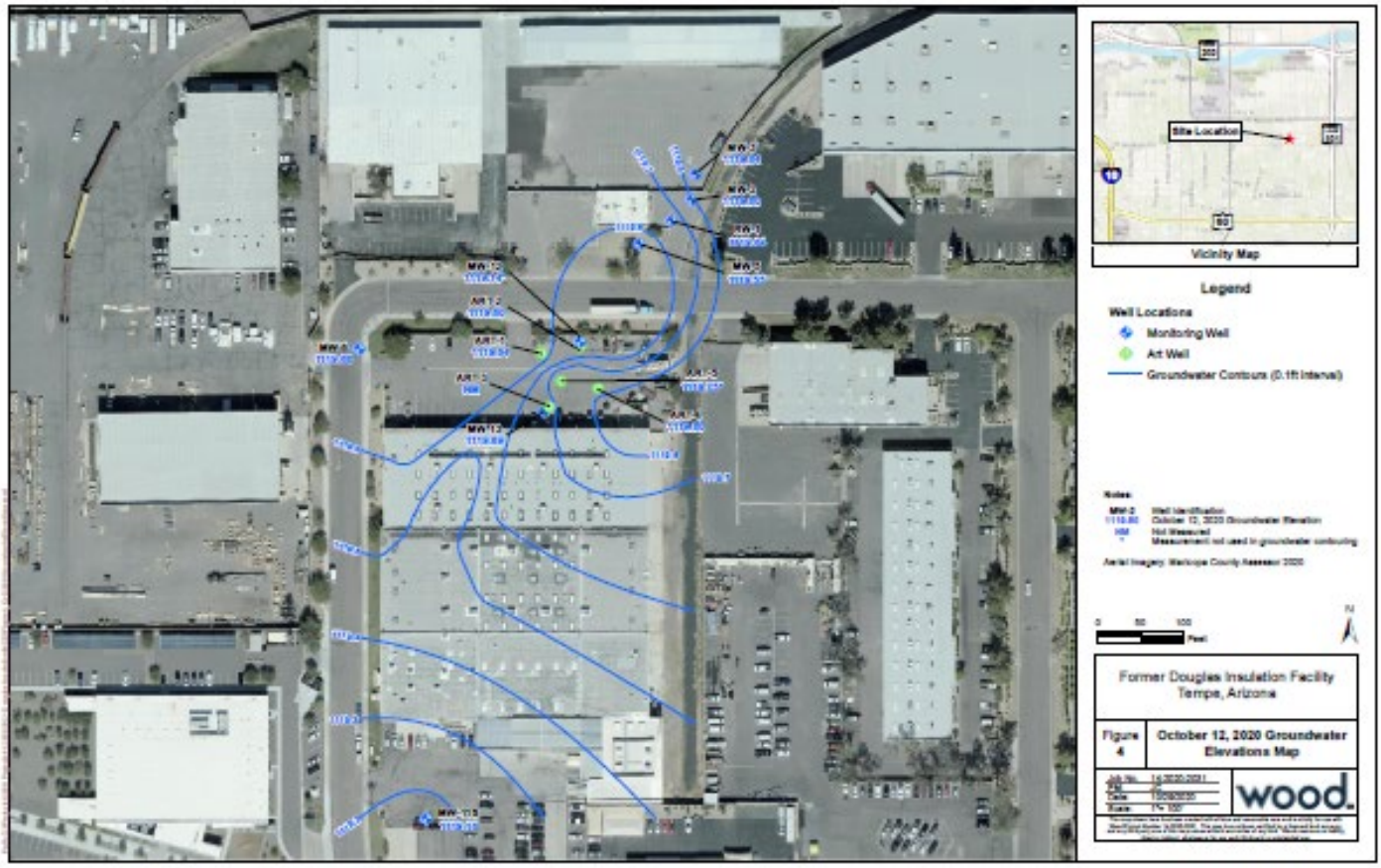
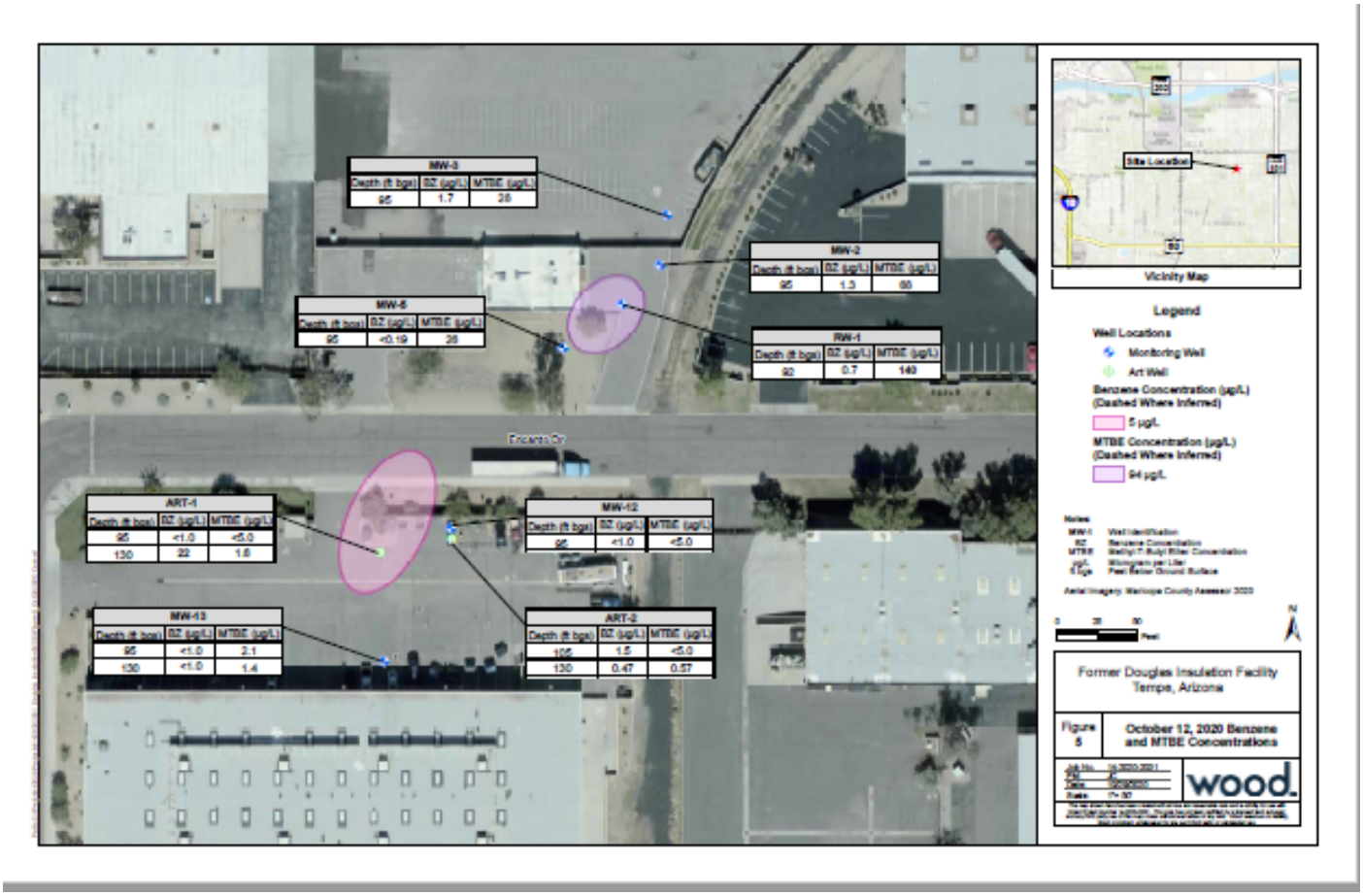
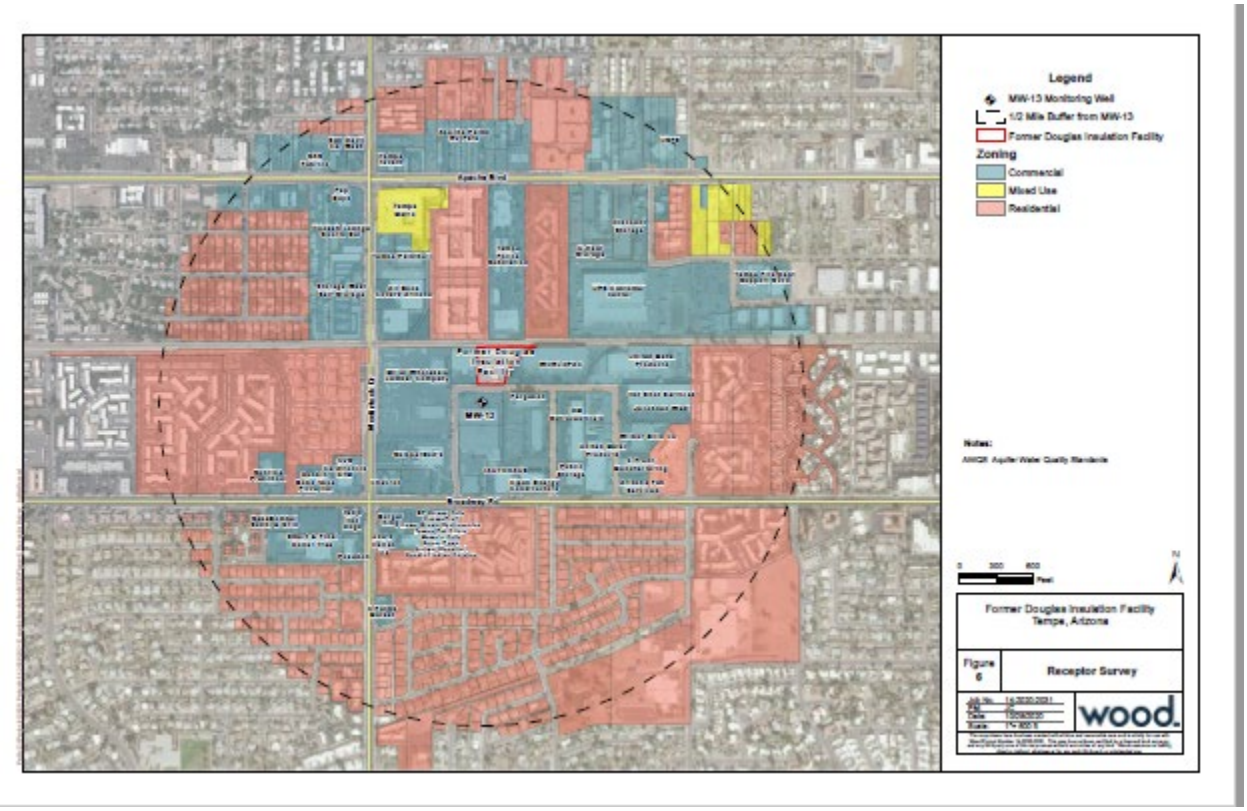

ART-1 Benzene Concentrations
Log Concentration (µg/L)
1000.00
100.00
10.00
1.00
0.10
Groundwater Elevation feet AMSL
1120.00
1118.00
1116.00
1114.00
1112.00
1110.00
1108.00
1106.00
1104.00
1102.00
Apr-18
Jun-18
Aug-18
Oct-18
Dec-18
Feb-19
Apr-19
Jun-19
Aug-19
Oct-19
Dec-19
Feb-20
Apr-20
Jun-20
Aug-20
Oct-20
105
120/130
Tier 1 Level
GWE


MW-13 Benzene Concentrations
10.00
1.00
0.10
Log Concentration (µg/L)
1120.00
1118.00
1116.00
1114.00
1112.00
1110.00
1108.00
1106.00
1104.00
1102.00
Groundwater Elevation feet AMSL
Mar-19
Apr-19
May-19
Jun-19
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
Feb-20
Mar-20
Apr-20
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
95
130
Tier 1 Level
GWE


Site Location
Vicinity Map
Legend
Well Locations
Monitoring Well
Art Well
Groundwater Contours (0.1ft Interval)
Former Douglas Insulation Facility
Tempe, Arizona
Figure 4
October 12, 2020 Groundwater Elevations Map
wood.


MW-3
Depth (ft bgs) | BZ (µg/L) | MTBE (µg/L)
95 | 1.7 | 28
MW-2
Depth (ft bgs) | BZ (µg/L) | MTBE (µg/L)
95 | 1.3 | 60
MW-6
Depth (ft bgs) | BZ (µg/L) | MTBE (µg/L)
95 | <0.19 | 26
RW-1
Depth (ft bgs) | BZ (µg/L) | MTBE (µg/L)
92 | 0.7 | 140
Encanto Dr
ART-1
Depth (ft bgs) | BZ (µg/L) | MTBE (µg/L)
95 | <1.0 | <5.0
130 | 22 | 1.6
MW-12
Depth (ft bgs) | BZ (µg/L) | MTBE (µg/L)
95 | <1.0 | <5.0
MW-13
Depth (ft bgs) | BZ (µg/L) | MTBE (µg/L)
95 | <1.0 | 2.1
130 | <1.0 | 1.4
ART-2
Depth (ft bgs) | BZ (µg/L) | MTBE (µg/L)
105 | 1.5 | <5.0
130 | 0.47 | 0.57
Site Location
Vicinity Map
Legend
Well Locations
Monitoring Well
Art Well
Benzene Concentration (µg/L)
(Dashed Where Inferred)
5 µg/L
MTBE Concentration (µg/L)
(Dashed Where Inferred)
94 µg/L
Former Douglas Insulation Facility
Tempe, Arizona
Figure 5
October 12, 2020 Benzene and MTBE Concentrations
wood.


Legend
MW-13 Monitoring Well
1/2 Mile Buffer from MW-13
Former Douglas Insulation Facility
Zoning
Commercial
Mixed Use
Residential
Notes:
MW-13
Former Douglas Insulation Facility
Tempe, Arizona
Figure
6
Receptor Survey
wood.