

PROPOSED LEAKING UST (LUST) CASE CLOSURE

The Arizona Department of Environmental Quality (ADEQ) is considering closure of the following leaking underground storage tank (LUST) cases:

LUST Case File #: 2157.01
Facility ID # 0-004506
Gila County

Shores Communication Service Inc.
627 East Ash Street
Globe, Arizona 85502

The Arizona Revised Statutes (A.R.S.) §49-1005(E) and Arizona Administrative Code (A.A.C.) R18-12-263.04 allow case closure of LUST sites with groundwater contamination above the Arizona Aquifer Water Quality Standards (AWQS) if certain site specific conditions are met. For the above-referenced LUST site, ADEQ has considered the following:

1. Characterization of the groundwater plume,
2. Removal or control of the source of contamination,
3. Groundwater plume stability,
4. Natural Attenuation,
5. Threatened or impacted drinking water wells,
6. Other exposure pathways,
7. Requirements of A.R.S. §49-1005(D) and (E), and
8. Other information that is pertinent to the LUST case closure approval.

Based on the results of a field receptor survey, there are no surface water, agricultural, or ecological receptors within one quarter mile of the site. Globe High School is across East Street from the site, and MW- 8 and MW-10 are located there. Neither well has contamination present. There are no active drinking water wells within one quarter mile of the site based on information found at the Arizona Department of Water Resources imaged records. The nearest City of Globe municipal supply well is located within one half mile of the site, but the well is not downgradient of the site. Measureable depths to groundwater beneath the site varies from approximately 23 to 40 feet at this facility, based on 2015 groundwater data. The general direction of groundwater flow beneath the site is to the southwest. The groundwater contaminant plume of release related compounds was reduced by air sparge/soil vapor extraction, followed by *in-situ* chemical oxidation (ISCO). Benzene concentrations exceed the Arizona Aquifer Water Quality Standard of 5 micrograms per liter ($\mu\text{g/L}$) in on-site monitor well MW-1(see table below), but the concentration is remaining stable since the ISCO treatments in June 2014. MW-1 is located at, or very near, the source of release number 2157.01.

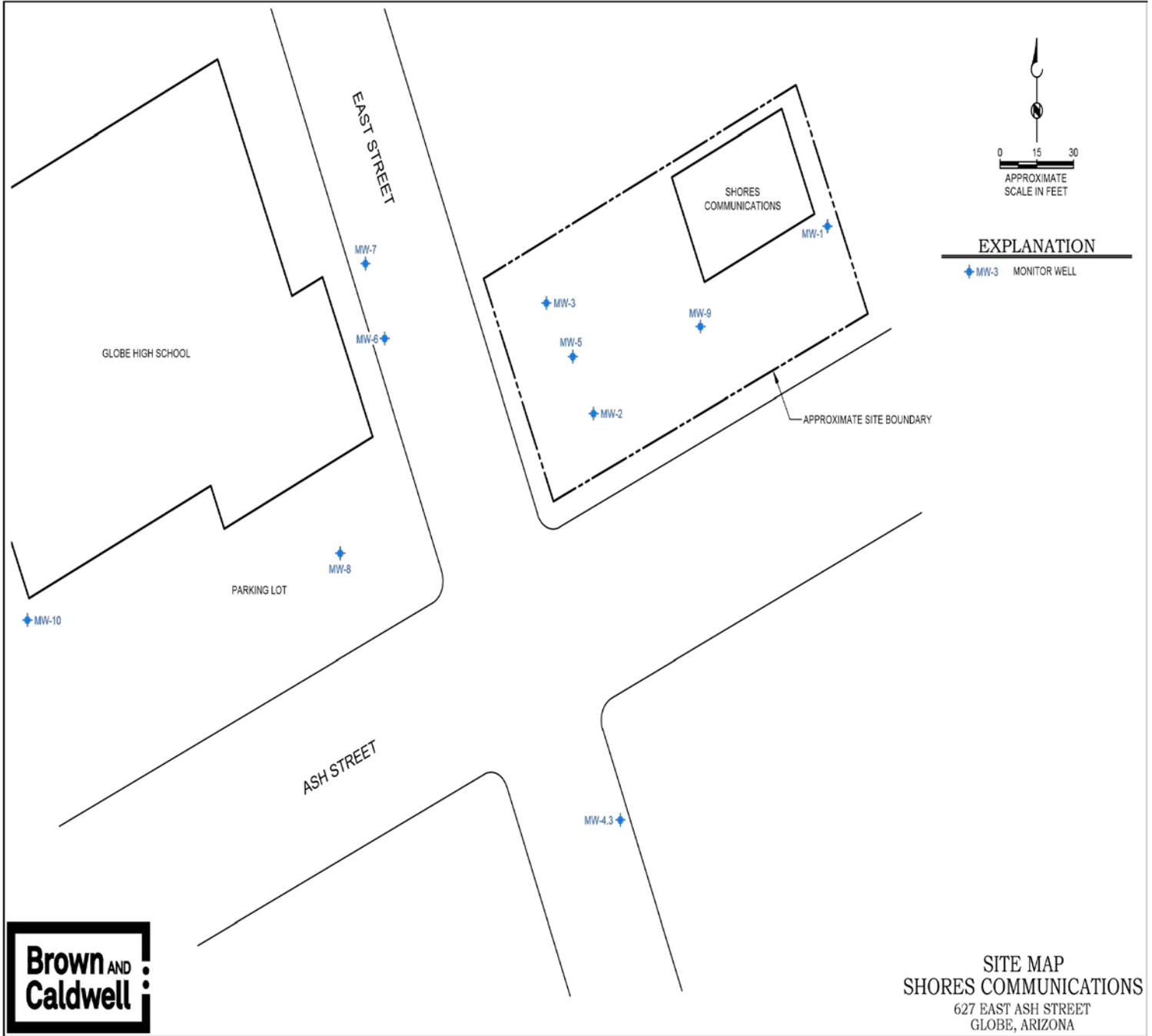
Site specific information concerning this closure is available for review during normal business hours at the [ADEQ Records Center](#), 1110 W. Washington St., Suite 140, Phoenix, AZ 85007. ADEQ welcomes comments on the proposed LUST case closure. Please call the Records Center at 602-771-4380 to schedule an appointment. A 30-day public comment period is in effect commencing **December 15, 2015** and ending **January 15, 2016**. Comments should be submitted in writing to the Arizona Department of Environmental Quality, Waste Programs Division, Attention: Debi Goodwin, 1110 W. Washington Street, Phoenix, AZ 85007.

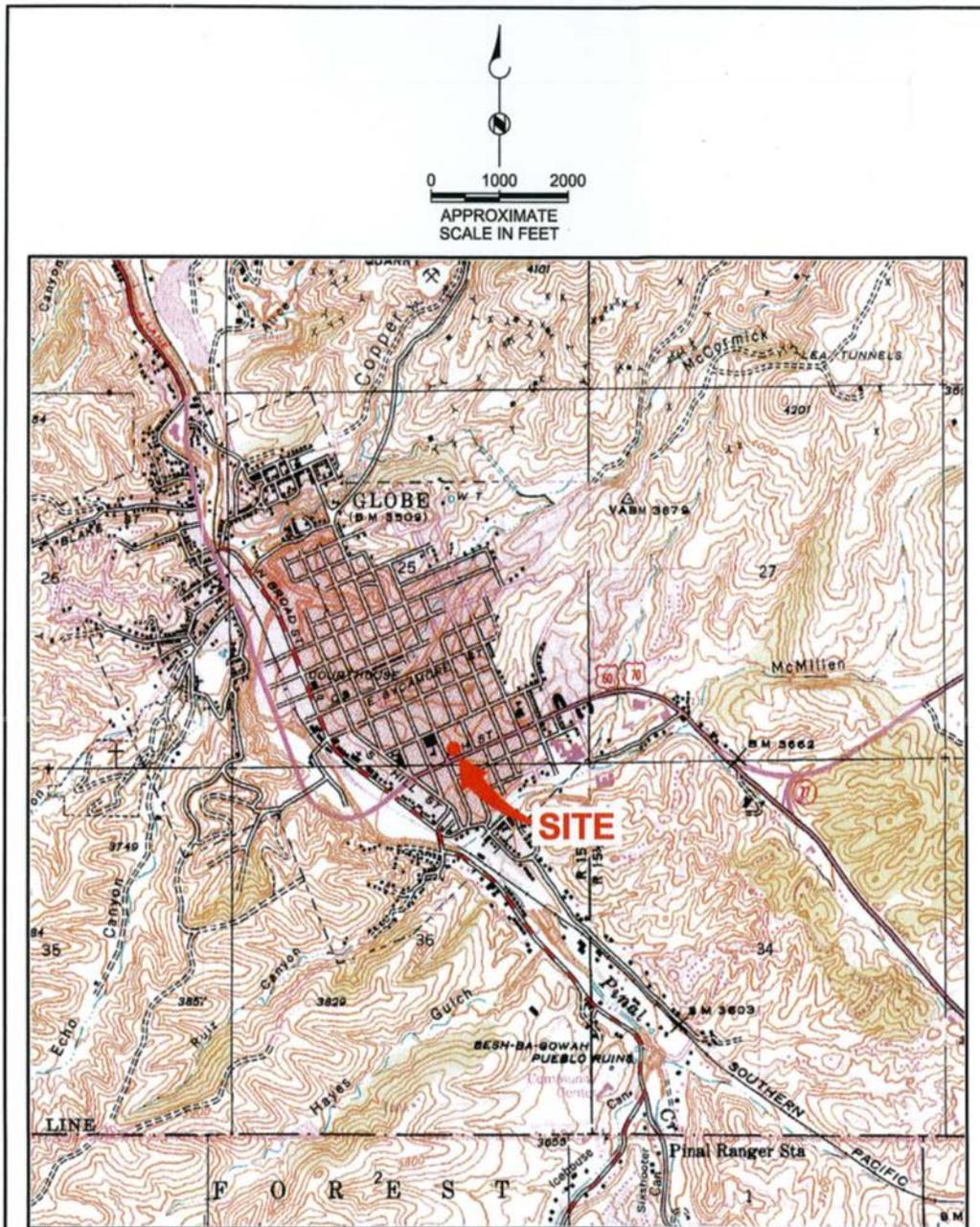
If sufficient public interest is demonstrated during the public comment period, ADEQ will announce and hold a public meeting. ADEQ will respond to written comments following the public comment period. For more information on this notice, please contact Debi Goodwin at 602-771-4453 or 800- 234-5677 ext. 771-4453 or at dg1@azdeq.gov.

Copies of the cited statutes and rules can be found at:
<http://www.azleg.gov/ArizonaRevisedStatutes.asp?Title=49>, and
http://www.azsos.gov/public_services/Title_18/18-12.htm

Groundwater Results Table

| Date of Compliance sampling | Benzene level in monitor well MW-1 (µg/L) |
|-----------------------------|-------------------------------------------|
| June 2011 | 260 /260 (duplicate) |
| July 2012 | 140/130 (duplicate) |
| July 2013 | 200/200 (duplicate) |
| ISCO treatments June 2014 | ----- |
| January 2015 | 20 |
| May 2015 | 23.8/26.3 (duplicate) |
| November 2015 | 23.6/26.8 (duplicate) |





SOURCE: USGS 7.5-MINUTE TOPOGRAPHIC QUADRANGLE - GLOBE, ARIZONA



Figure 1
VICINITY MAP
SHORES COMMUNICATIONS
627 EAST ASH STREET
GLOBE, ARIZONA

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ADEQ  **Memorandum**
Arizona Department
of Environmental Quality

Date: December 9, 2015

To: LUST File

From: Debi Goodwin, UST Risk Assessor
State Lead Unit
WPD Corrective Action Section

Subject: Tier 3 Risk Assessment
Shore's Communications
Facility No. 0-004506 LUST No. 2157.01

Background

The Site has operated as a communication service and repair facility for several years. The Site is located at 627 E. Ash Street in Globe, AZ and operated as a service station during the 1950s and 1960s. There was one 1,000 gallon UST that was reportedly installed in 1974. Holes were found in the product line when the UST was removed in 1992. A release was confirmed and assigned LUST number 2157.01. The UST was removed, and the tank pit was backfilled with the excavated soil. In 1997, site characterization activities included the installation of monitoring wells, and two soil borings. Free product recovery was conducted from 2007 to 2008. Three monitoring wells, two air sparge wells, two air sparge pilot test wells and two SVE pilot test wells were installed in 2007. Additional wells were installed in 2008. An AS/SVE system was installed in 2008 and ran until 2011.

Historic soil data shows that benzene concentrations exceed the rSRL in the 1997 analytical results collected from MW-5 at 40-41.5 feet bgs. The soil above this zone was non-detect for benzene. It is presumed that groundwater was encountered after the 40 foot depth. The soil is carbonate-cemented sands and gravels of the Gila Conglomerate, with a gravelly layer at around 30 feet bgs. The historic high groundwater elevation was in 1992 at 24.5 feet. The depth to groundwater in 2007 was 32.98 feet. The groundwater gradient is to the southwest under semi-confined conditions. Several monitoring wells had VOC contamination present over the respective AWQS. MW-1 is the only well that has continued to show benzene concentrations consistently over the AWQS since 1992.

Purpose

Current groundwater data provided by Brown and Caldwell (BC), contractor to the State Lead Unit, and all other available site information has been used by ADEQ to determine whether remaining levels of contaminants at the site are adequately protective of human health and the environment.

Data Evaluation

Groundwater

Groundwater samples have been collected at the site since 1992. Free product was found in a few of the wells between 2006 and 2008. Groundwater data collected, after the AS/SVE system operation, in 2012 shows that the contamination level of benzene in MW-1 dropped from the July sampling event (140/130 µg/L) to the September sampling event (48/110 µg/L using Passive Diffusion Bags [PDB]), and then lower for the November sampling event (21/16 µg/L using PDBs). MW-1 was the designated duplicate sample location, so both benzene concentrations are reported.

Benzene concentrations in MW-1, in May 2013, was 130/110 µg/L sampled with PDB. In July, the concentration increased to 200/200 µg/L, and then dropped in October 2013 to 180/160 µg/L. In January 2014, the benzene concentration was stable at 190 µg/L. After an ISCO event, the benzene concentration dropped to 5.3 µg/L in May 2014. In situ chemical oxidation (ISCO) injections of persulfate were done in June 2014. In July and October 2014, the concentration remained stable at <10 µg/L and 6.3 µg/L (these were grab samples, not compliance samples). To evaluate any rebound from the ISCO event, sampling was conducted in January 2015 and benzene concentration increased slightly to 20 µg/L. In May 2015, the benzene concentration was 23.8 µg/L. The most recent sampling event was November 2015 and the benzene concentration is remaining stable at 23.6 µg/L. No other VOCs exceed applicable AWQS. In 2015, the depth to groundwater ranged from 23 to 40 feet.

Soil Vapor

Temporary soil vapor probes installed at 5 feet. Air Toxics analyzed the samples for VOCs by EPA Method TO-15 (did include the ADHS approved additional 31 compounds dated November 2011). Laboratory quality assurance (QA) measures are adequate for risk assessment data quality objectives. The field QA measures are acceptable for risk assessment data quality objectives. The samples were collected in 1-L Summa canisters. The canister pressure readings indicated adequate sample volume for analysis. The tracer compound (1,1-DFA) was not detected in any of the samples collected that were used as part of the risk assessment. An ambient air sample and a duplicate sample were collected. It is noted on the field sheets that the samples were purged using the PID instead of a syringe, and the purge volume was calculated at 80% of 3 purge volumes to prevent over purging. A *Summary of Detected Analytes in Soil Vapor Samples* table was provided.

Tier 3 Risk Assessment

The maximum concentrations of chemicals were modeled for both the cancer risk value (ELCR) and the hazard index (HI) or non-carcinogenic health hazard. ADEQ modeled the soil vapor data using the EPA on-line screening version of the Johnson and Ettinger (J&E) model and chemicals are eliminated from inclusion in the risk assessment if they are not present at levels above 1/10th of the EPA Regional Screening Level November 2012, levels below the laboratory reporting limit, were a common laboratory contaminant and found at levels less than 5 times the concentration found in the field (equipment) blank, or if insufficient toxicity data is available or the chemical is not listed in the chemical pull down list. The risk assessment includes all compounds of concern (CoCs) associated with the fuel release and also non-petroleum related compounds (PCE) to determine cumulative risk. The High Indoor Air Prediction for the J&E Simulation Results is used as the first comparison for a conservative approach. Sand was used in the model for soil type, since the field notes state sand and gravel. The indoor air exchange rate used was 0.5 hr⁻¹ to allow for typical heating/cooling systems present in homes.

Since there are carcinogens among the CoCs, the cumulative ELCR risk of 1 x 10⁻⁵ is used instead of 1 x 10⁻⁶, for a more conservative approach. This approach is also used for soil remediation levels when dealing with carcinogens. ADEQ's results show that both the ELCR for the petroleum related compounds is 1.1 x 10⁻⁶. The HI value for the petroleum related compounds is less than 1.

For alternative groundwater closure under A.A.C. R-18-12-263.04, several criteria must be met. Existing groundwater data shows that the groundwater plume is characterized, the source of contamination (former UST system) has been removed/controlled by the active remediation system that operated, the groundwater plume is stable, and based on an ADWR ¼ mile well search, there are 33 registered wells but no active drinking water wells are located downgradient of the site. The nearest City of Globe municipal well is located within ½ mile of the site, but it is not downgradient of the site. The VOC contamination that is present in groundwater is limited on-site to MW-1, the source well. The other nine monitoring wells are located on and off site and have no VOC contamination over an

applicable AWQS. The in-situ chemical oxidation reduced the contamination so that only benzene remains as the only CoC that has concentrations that exceed an applicable regulatory standard.

In a ¼ mile receptor survey, the closest receptor is Globe High School which is across East Street from the Site. There are two monitoring wells (MW-8, MW-10) located at the school, and no benzene is present over laboratory reporting limits.

Conclusions and Recommendations

A.A.C. R-18-7-206(D) and A.A.C. R-18-12-263.01 and A.A.C. R-18-12-263.04 allow for a site specific risk assessment. Under A.A.C. R-18-7-206(D), multiple contaminants, multiple pathways of exposure, uncertainty of exposure and sensitive populations are evaluated as part of a site specific risk assessment. Any residual petroleum related soil contamination may be present in the subsurface, so there isn't a risk posed by the dermal contact or ingestion exposure routes. The soil vapor survey demonstrates the inhalation exposure route shows an acceptable risk. The groundwater data collected on-site shows only benzene is present over an applicable regulatory standard but it doesn't pose a risk to any drinking water sources and no sensitive receptors were identified.

Based on the data collected, it is recommended that LUST releases 2157.01 be closed under A.A.C. R-18-12.263.03 for soil and A.A.C. R-118-12-263.04 for groundwater.

If you have any questions regarding this memo, please contact me at (602) 771-4453 or dq1@azdeq.gov.