

## 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 #: 4843.01**  
**Facility ID # 0-005027**  
**Maricopa County**

**Thomas Heating and Air Conditioning**  
**3726 East Thomas Road**  
**Phoenix, Arizona 85018**

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. 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 depth to groundwater beneath the site is approximately 40 feet at this facility. The general direction of groundwater flow beneath the site is to the south. Contaminant concentration have never been detected in groundwater monitor wells MW-5 and MW-6, located near the site boundary in the downgradient and cross gradient directions from the source area. The groundwater contaminant plume of release related compounds was reduced by soil vapor extraction, followed by *in-situ* chemical oxidation (ISCO). Benzene and Ethylene dibromide (EDB) concentrations exceed the Arizona Aquifer Water Quality Standards in on-site monitor well MW-2 (see tables below). This well is located at, or very near, the source of release no. 4843.01.

Site specific information concerning this closure is available for review during normal business hours at <http://www.azdeq.gov/function/assistance/records.html>, 1110 W. Washington St., Suite 140, Phoenix, AZ 85007. ADEQ welcomes comments on the proposed LUST case closure. Please call the UST File Room at 602-771-4380 to schedule an appointment. A 30-day public

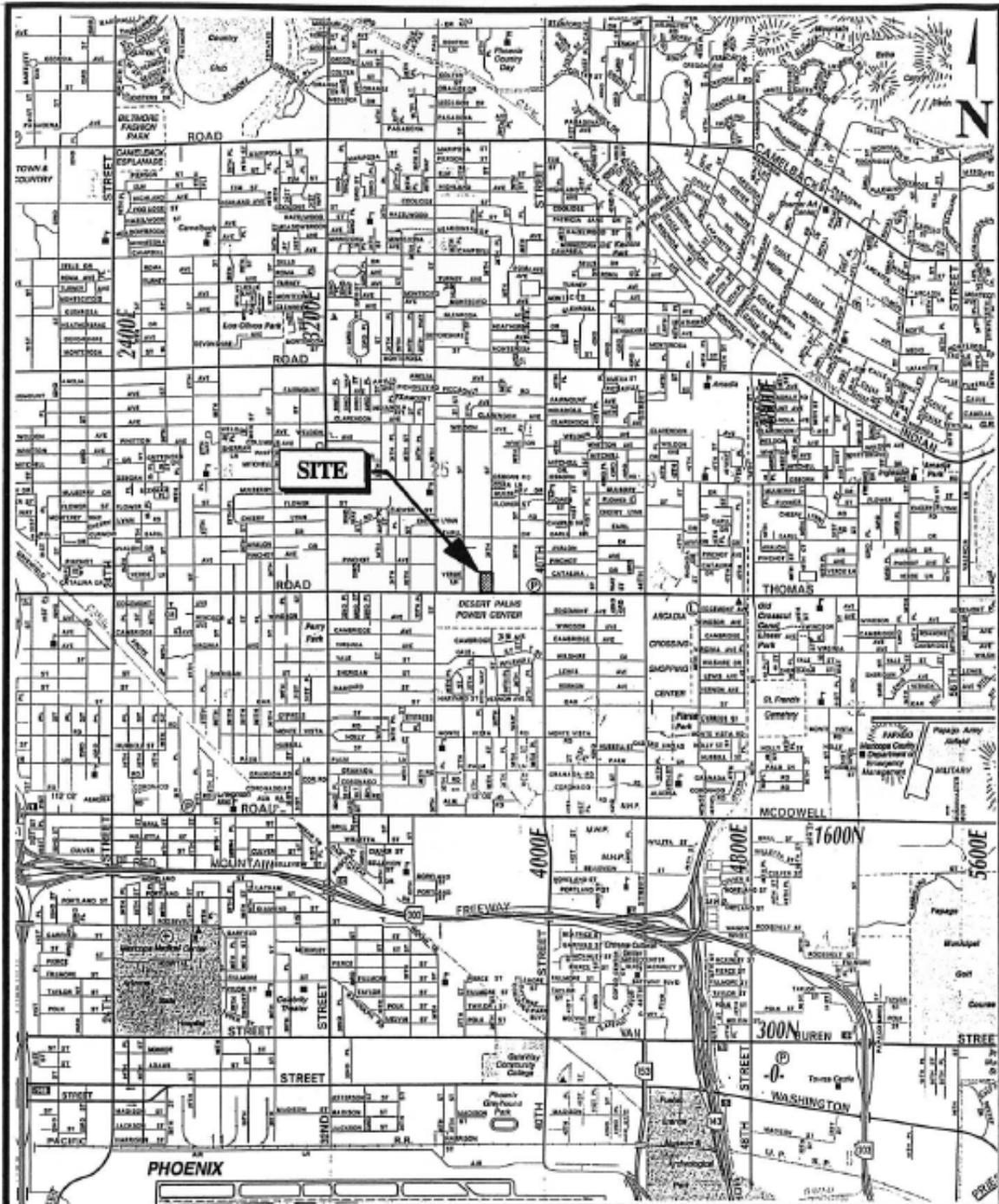
comment period is in effect commencing **April 18, 2016** and ending **May 18, 2016**. Comments should be submitted in writing to the Arizona Department of Environmental Quality, Waste Programs Division, Attention: David Pettigrew, 1110 W. Washington Street, Phoenix, AZ 85007.

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 David Pettigrew at 602-771-4265 or 800- 234-5677 ext. 771-4265 or at [dp1@azdeq.gov](mailto:dp1@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](http://www.azsos.gov/public_services/Title_18/18-12.htm)

Date of sampling	Benzene contaminant levels in micrograms per liter (µg/L) in monitor well MW-2
February 2015	74
May 2015	1.5
August 2015	43.3
December 2015	46
February 2016	35
Tier 1 Standard	5

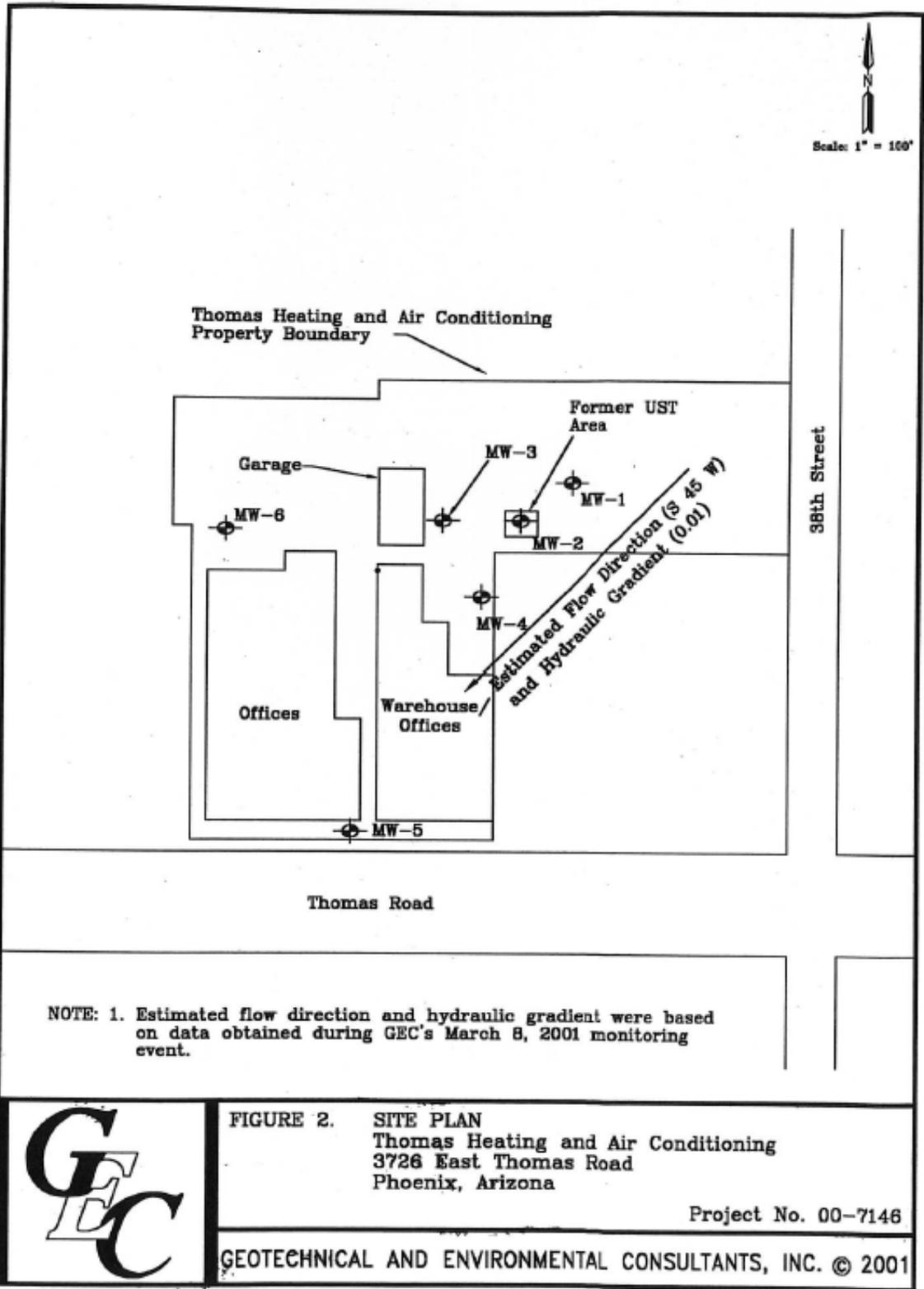
Date of sampling	EDB contaminant levels in micrograms per liter (µg/L) in monitor well MW-2
February 2015	1.2
May 2015	0.096
August 2015	0.486
December 2015	0.48
February 2016	0.063
Tier 1 Standard	0.05



**FIGURE 1. SITE LOCATION MAP**  
Thomas Heating and Air Conditioning  
3726 East Thomas Road  
Phoenix, Arizona

Project No. 00-7146

**GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.**



**ADEQ**  **Memorandum**  
Arizona Department  
of Environmental Quality

**Date:** April 7, 2016

**To:** LUST File

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

**Subject:** Tier 3 Risk Assessment  
Thomas Heating and Cooling  
Facility No. 0-005027 LUST No. 4843.01

**Background**

The site is an irregular shaped parcel of land located at the northwest corner of Thomas Road and 38<sup>th</sup> Street. Thomas Heating and Air Conditioning (THAC) formerly occupied the site; however, it is currently privately owned and operates as a dental clinic, which is located at the southwest corner of the parcel facing Thomas Road. Additional structures at the site include office, warehouse and maintenance buildings previously used by THAC. A 2,000-gallon underground storage tank (2K UST) reportedly was in service at the site until it was abandoned in place in 1979. A 6K UST was installed to the southwest of the smaller tank in the same year. The 2K UST subsequently was removed sometime prior to 1985 and the 6K UST was removed in 1990. Samples collected beneath the 6K UST at the time of its removal did not indicate that a release had occurred from this tank.

Two soil borings were advanced in the vicinity of the former 2K UST in February 1998. A release was reported based on the soil sample results from these borings. In August 2000, four additional soil borings were drilled in and around the former 2K UST area to further assess the identified release. These borings were drilled to 55 feet bgs and completed as monitor wells MW-1, -2, -3 and -4 each screened below 15 feet bgs to assess groundwater conditions beneath the area. Soil sample results from well boring MW-2 located within the source area indicated that the release had migrated vertically to groundwater, which was reported at a depth of approximately 34 feet below ground surface (bgs). A free product layer was measured on top of the water table in source well MW-2. Gasoline constituent concentrations were reported in excess of their respective Aquifer Water Quality Standards (AWQSs) in cross-gradient well MW-3 and down-gradient well MW-4. Two additional monitoring wells (MW-5 and MW-6) were installed near the property boundary in 2001 to define the down-gradient and cross-gradient extent of groundwater contamination, respectively. Groundwater samples collected to date from these wells indicate that the groundwater plume has not migrated beyond the site boundaries.

In September 2007, four nested soil vapor extraction/air sparge (SVE/AS) wells were installed in and around the UST area under State Assurance Fund work plan (see Figure 1). The AS wells were installed to a depth of 55 feet bgs and screened below 50 feet bgs. The SVE wells were installed to a depth of 30 feet bgs within the same boring and screened below 15 feet bgs. Groundwater reportedly was encountered at approximately 42 feet bgs within the SVE/AS well borings. The soil vapor extraction and air sparging systems were activated in May and August 2008, respectively. Both systems were shut down in April 2010. Groundwater elevation data indicate that the average depth to water dropped more than 11 feet between March 2001 and August 2007 (average depth ~40.81 feet). This drop in water levels apparently resulted in a smear zone below the SVE well screens.

### **Tier 3 Risk Assessment**

Terranext conducted the vapor modeling using the EPA VISL calculator Version 3.4. Terranext modeled two sets of data- one for the release area, and one for the dentist office. The conclusion was that the cancer risk was below  $10^{-6}$  and the non-cancer risk was below 1 for both data sets. ADEQ modeled the soil vapor data using the EPA on-line screening version of the Johnson and Ettinger (J&E) model to verify Terranext's conclusions. The maximum concentrations of chemicals were modeled for both the cancer risk value (ELCR) and the hazard index (HI) or non-carcinogenic health hazard, 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 for resident air dated November 2015, 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 in the Regional Screening Level table 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 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. Loam was used in the model for soil type. The air exchange rate was raised to  $0.5[\text{hr}^{-1}]$  to allow for heating and cooling in a residence.

Since there are carcinogens among the CoCs, the cumulative ELCR risk of  $1 \times 10^{-6}$  is used instead of  $1 \times 10^{-5}$ , for a more conservative approach. This approach is also used for soil remediation levels when dealing with carcinogens. ADEQ determined that three CoCs needed evaluation for the release area, and four CoCs for the dentist office area. ADEQ's results also show that the ELCR for the petroleum related compounds is less than  $10^{-6}$  and the HI value for the petroleum related compounds is less than 1 for both areas. These values demonstrate acceptable cancer and non-cancer inhalation risk.

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  $\frac{1}{4}$  mile well search, there are 19 registered wells but no drinking water wells (municipal or domestic). The VOC contamination that is present in groundwater is limited on-site to MW-1A and MW-3A. The other monitoring wells have no VOC contamination over an applicable AWQS. There are no sensitive receptors within a  $\frac{1}{4}$  mile of the site. Both commercial and residential use properties surround the site.

### **Conclusions and Recommendations**

A.A.C. R-18-7-206(D), 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 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 VOC 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 TEL soil contamination is also subsurface. There is no dermal contact, ingestion or inhalation risk due to its lower volatility.

The groundwater data collected on-site shows only benzene and 1,2-DCA present over an applicable regulatory standard but it doesn't pose a risk to any drinking water sources.

Based on the data collected, it is recommended that LUST release 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](mailto:dq1@azdeq.gov).