

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 #: 5493.01, .02
Facility ID # 0-008132
Yuma County

Carquest #84
2500 E. 16th Street
Yuma, Arizona 85365

This commercial property (the Site) is located at 2500 East 16th Street in Yuma. The Site was used as a service station prior to 1968, but the UST Owner/Operator was never identified. The two USTs were closed in place in July 1970. The USTs were removed in 2006. The Site has been occupied by various businesses which included a retail auto part sales (Carquest). The property most recently operated as Wild West Motor Sports which sold and repaired motor sport vehicles. The property was sold in August 2014 to the current owner, 2500 HIGHWAY 95, LLC. Currently the site is vacant and up for sale/lease.

The UST system was removed in June 2006 by the current property owner in order to obtain a loan refinance. Soil samples collected during the UST permanent closure indicated trimethylbenzene contamination present over applicable regulatory standards at 3 and 14 feet bgs. Proposed site characterization activities included the installation of soil borings and monitoring wells by the property owner and its contractor NEI Environmental, under the State Assurance Fund. No work was conducted. In 2009, the property owner was not interested in pursuing corrective actions as an SAF volunteer. In August 2011 the property owner at that time requested assistance from ADEQ's State Lead Unit (SLU) and was accepted into the SLU program. Upon the sale of the property in 2014 SLU contacted the current property owner and they have continued ADEQ SLU involvement in the site.

In 2012, six soil borings and five monitoring wells were installed by the State Lead Unit to characterize the releases. Soil samples from 5, 10, 15 and 20 feet bgs were collected in SB-1 through SB-6. The soil samples were analyzed at each depth for VOCs by EPA Method 8260B (including the AZ extended list). 1,2,4-TMB was found at 15 feet in SB-1 at 68 mg/Kg which exceeds the residential SRL. A soil sample was collected at the source area for tetraethyl lead (TEL) analysis due to the possibility that leaded gasoline was historically present in the USTs. TEL was not detected in the sample. MW-1 through MW-3 had several VOCs with concentrations that exceed an applicable regulatory standard [benzene, toluene, ethylbenzene, DBCP, EDB (a lead scavenger), 1,1-DCA]. MW-4 and MW-5 had no VOC detections that exceed an applicable regulatory standard. DBCP is a soil fumigant used in agriculture and 1,1-DCA is a chlorinated solvent breakdown product. Both DBCP and 1,1-DCA were not detected in any monitoring well after the January 2013 sampling event. In October of 2012, the five monitoring wells were sampled for VOCs, and MW-1 was also sampled for EDB by EPA Method 504.1 to obtain a lower detection level, and to verify if EDB is actually in the groundwater. The EDB concentration was non-detect. Site characterization was approved in June 2013. The groundwater was treated with oxygen releasing compound (ORC) in 2014 and again in 2015. As of September 2016, only MW-1 has VOC contamination (ethylbenzene) that exceed an applicable regulatory standard.

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) or Tier 1 Standards.

ADEQ has considered the results of a site specific assessment and the rule specific criteria below:

1. *Threatened or impacted drinking water wells:* 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 (ADWR) imaged records. The City of Yuma's potable water supply is mainly treated Colorado River water.
2. *Other exposure pathways:* Based on a records search there are no surface water, agricultural, or ecological receptors within one quarter mile of the site. There are residences located approximately 300 feet north of the site. A soil vapor survey was conducted in 2013 to evaluate the potential for inhalation exposure from VOC contamination present in the subsurface soil and also the shallow groundwater. For the VOC contamination present in soils at depth in SB-1, the only potential exposure route is inhalation by vapor intrusion since the VOC that exceeded a regulatory standard was within the smear zone. The soil samples collected between 5 and 15 feet had no VOC contamination present over an applicable regulatory standard, so dermal contact and ingestion are not complete exposure pathways. The soil vapor data collected near the release area shows the cancer risk does not exceed the 10^{-6} risk level and the non-cancer risk value is below 1. These values demonstrate the inhalation exposure route shows an acceptable risk from any remaining VOC contamination left in subsurface soils. As an ultra-conservative measure, the current maximum groundwater contaminant concentration for benzene and ethylbenzene were modeled to evaluate possible vapor intrusion issues. The cancer and non-cancer risk values both show an acceptable risk level. The dermal contact and ingestion exposure routes also pose no unacceptable risk.
3. *Groundwater plume stability:* The groundwater contaminant plume is limited to on-site and is remaining stable. The depth to water was approximately 15-feet in September 2016. In September 2016, only ethylbenzene concentrations exceeded the applicable Aquifer Water Quality Standards in MW-1. Historically, VOC concentrations declined after the ORC was used. As the ORC lost effectiveness, VOC concentration increased, but never returning to the highest historic concentrations. Based upon the September 2016 results VOC concentrations continue to decline due to natural attenuation. VOC concentrations fluctuate with the water level. Depth to groundwater levels ranged from approximately 12-feet below ground surface (bgs) to approximately 19-feet bgs.
4. *Characterization of the groundwater plume:* A total of five monitoring wells were installed and collection of volatile organic compounds (VOCs) samples took place between 2012 and 2016. Groundwater sampling results indicate that the plume is characterized and contained to the site.
5. *Natural Attenuation:* Groundwater data has been collected between October 2012 and September 2016. The overall concentration of the VOCs (benzene and ethylbenzene) was reduced by the use of an oxygen reducing compound (ORC) in 2014 and again in

2015. Based upon September 2016 sampling results groundwater VOC concentrations continue to decline.

6. *Removal or control of the source of contamination:* The UST system was unused since approximately 1970 and removed in 2006. Limited remedial activities included treating the contaminated groundwater with ORC.
7. *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.
8. *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.

Site specific information concerning this closure is available for review during normal business hours at the ADEQ Records Center <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 Records Center at 602-771-4380 to schedule an appointment. A 30-day public comment period is in effect commencing **October 4, 2016** and ending **November 4, 2016**. Comments should be submitted in writing to the Arizona Department of Environmental Quality, Waste Programs Division, and Attention: Rick Brunton, 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 Rick Brunton at 602-771-4745 or 800- 234-5677 ext. 771-4745 or at rlb@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

Historic groundwater concentrations in MW-1

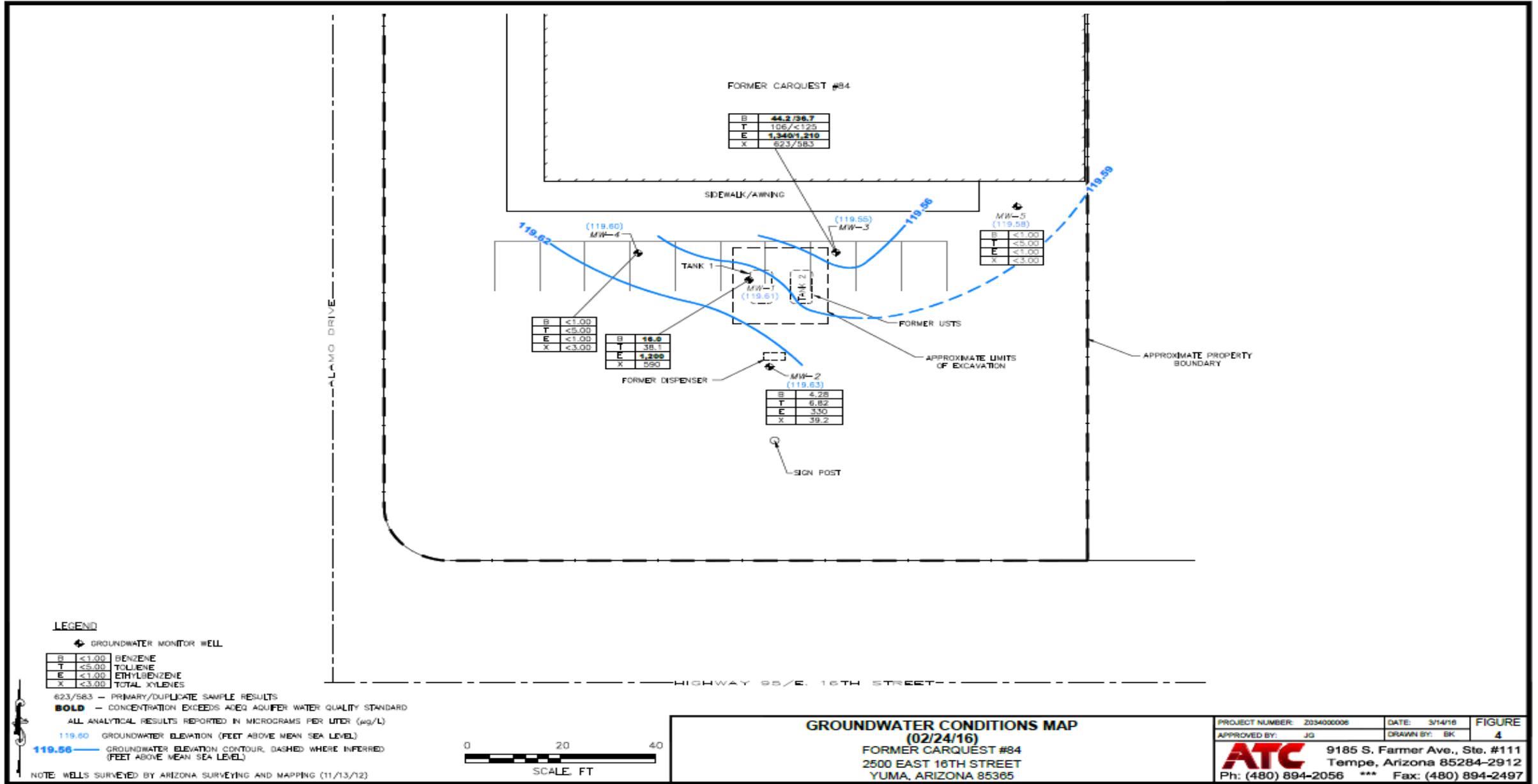
Date	Benzene AWQS is 5µg/L	Ethylbenzene AWQS is 700µg/L	Depth to Groundwater (feet)
9/2016	<6.62*	1,170	14.99
2/2016	16	1,200	18.75
12/2015	2.58	133	17.70
9/2015	41.9	2,540	16.39
6/2015 ORC removed			
1/2015 ORC installed	9.9	690	17.81
7/2014	10	790	13.20
6/2014 ORC removed			
4/2014 ORC installed	29	2,900	12.92
1/2014	19	2,500	14.17
10/2013	53	3,400	14.21
7/2013	99	4,000	11.96
1/2013	55	2,800	12.76
10/2012	100	5,000	12.70

* Benzene result was reported to the Reporting Limit, but quantified to the Method Detection limit. Benzene was not detected in the sample based on data qualifier.

Historic groundwater concentrations in MW-3

Date	Benzene AWQS is 5µg/L	Ethylbenzene AWQS is 700µg/L	Depth to Groundwater (feet)
9/2016*	<5.00/<5.00	201/173	14.91
2/2016	44.2	1,340	18.57
12/2015	19.4	1,900	17.63
9/2015	8.15	796	16.29
6/2015 ORC removed			
1/2015 ORC installed	16	820	17.71
7/2014	13	920	13.12
6/2014 ORC removed			
4/2014 ORC installed	37	2,900	12.85
1/2014	30	3,900	14.09
10/2013	58	3,400	14.14
7/2013	74	3,700	11.86
1/2013	80	2,900	12.68
10/2012	94	3,200	12.80

*MW-3 Groundwater sample was selected for duplication



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ADEQ  **Memorandum**
Arizona Department
of Environmental Quality

Date: April 8, 2016
To: LUST File
From: Debi Goodwin, UST Risk Assessor
State Lead Unit, WPD Corrective Action Section
Subject: Tier 3 Risk Assessment
Former Carquest #84
F 0-008132 L 5493.01, .02

Background

This commercial property (the Site) is located at 2500 East 16th Street in Yuma. The Site was used as a service station prior to 1968, but the UST Owner/Operator was never identified. The two USTs were closed in place in July 1970. The Site has been occupied by various businesses which included retail auto part sales (Carquest). The property most recently operated as Wild West Motor Sports which sold and repaired motor sport vehicles. The property was sold to the current owner in August 2014, and is currently vacant and up for sale/lease.

The UST system was removed in June 2006 by the current property owner in order to obtain a loan refinance. Soil contamination was confirmed at 3 and 14 feet bgs and LUST release numbers were assigned to the dispenser and west UST respectively. Proposed site characterization activities included the installation of soil borings and monitoring wells by the property owner and its contractor NEI Environmental, under the State Assurance Fund. No work was conducted. In 2009, the property owner was not interested in pursuing corrective actions as an SAF volunteer.

Purpose

The State Lead Unit contracted ATC in 2012 to characterize the contamination by installing soil borings and monitoring wells (MW-1 through MW-5). The boring logs indicate that the subsurface stratigraphy consists of clayey silt to a depth of 10 feet bgs, clay with silt and/or sands to 15 feet, and silty sand to 34 feet, which was the maximum depth drilled. The depth to groundwater was at 15 feet bgs. The depth to water was 13 feet after well completion and development.

Six soil borings were drilled in July 2012. SB-1 and SB-2 were placed at release areas .01 (UST tank) and .02 (dispenser) respectively. SB-3 through SB-6 were placed for lateral characterization of the release areas. Groundwater was encountered in every boring at approximately 15 feet bgs. Five monitoring wells were completed to a depth of 30 feet bgs. Based on the data and also the shallow depth to groundwater, soil vapor samples were collected in November 2013. Groundwater samples were collected between October 2012 and

January 2015. Groundwater remediation was conducted using oxygen reducing compound (ORC). ORC was placed into monitoring wells MW-1 through MW-3 in April 2014. The ORC was removed in June 2014. The ORC was replaced into the monitoring wells in January 2015. They were permanently removed in June 2015.

The information described above and all available information was utilized by ADEQ to determine whether levels of contaminants at the site are adequately protective of human health and the environment.

Tier 3 Risk Assessment

Soil

Soil samples from 5, 10, 15 and 20 feet bgs were collected in SB-1 through SB-6. The soil samples were analyzed at each depth for VOCs by EPA Method 8260B (including the AZ extended list). 1,2,4-TMB was found at 15 feet in SB-1 at 68 mg/Kg which exceeds the residential SRL. VOCs were detected in several soil samples taken from the other soil borings above the laboratory reporting limit but none of the concentrations exceeded an applicable rSRL. A soil sample was collected at the source area for tetraethyl lead (TEL) analysis due to the possibility that leaded gasoline was historically present in the USTs. TEL was not detected in the sample.

Groundwater

In July 2012, grab groundwater samples were collected from the soil borings and analyzed for VOCs by EPA Method 8260B (including the AZ extended list) and PAHs by EPA Method 8310. MW-1 through MW-3 had several VOCs with concentrations that exceed an applicable regulatory standard [benzene, toluene, ethylbenzene, DBCP, EDB, 1,1-DCA]. These wells also showed other petroleum related VOCs, but there is no applicable regulatory standard for them. MW-4 and MW-5 had no VOC detections that exceed an applicable regulatory standard. DBCP is a soil fumigant used in agriculture and 1,1-DCA is a chlorinated solvent breakdown product. Neither are petroleum related CoCs. Both DBCP and 1,1-DCA were not detected in any monitoring well after the January 2013 sampling event. In October of 2012, the five monitoring wells were sampled for VOCs, and MW-1 was also sampled for EDB by EPA Method 504.1 to obtain a lower detection level, and to verify if EDB is actually in the groundwater. The EDB concentration was non-detect. Groundwater monitoring has continued through February 2016.

In February 2016, the five monitoring wells were sampled and the groundwater samples were analyzed for VOCs by EPA Method 8260B (including the AZ extended list) by ESC. In MW-1, benzene and ethylbenzene concentrations exceed an applicable regulatory standard (16 µg/L and 1,200 µg/L respectively). In MW-3, benzene and ethylbenzene concentrations exceed an applicable regulatory standard (44.6 µg/L and 1,340 µg/L respectively). The plume appears stable. The depth to groundwater is approximately 18.5 feet.

The shallow groundwater in these monitoring wells is not used as potable drinking water. An ADWR database search conducted by ATC shows there are no domestic or public drinking water wells located within ¼ mile of the characterized groundwater plume.

Soil Vapor Sampling

In November 2013, a shallow soil vapor sampling survey was conducted. Samples were collected from release areas .01, and .02 and near the repair shop. Vapor probe depth was

approximately 5 feet bgs in silty clay, and the samples were collected in 1-L Summa canisters. The samples were analyzed by EPA Method TO-15 and included the additional compounds required for ADEQ. Laboratory QA/QC was acceptable for Tier 3 risk assessment, and the field QA/QC was mostly acceptable. Tracer compound (DFA) was detected in sample SV-1, SV-6 and SV-7 in concentrations significantly greater than 20 ppbv, which was the laboratory detection limit for the samples, which may indicate a leaky soil vapor probe. The sample rates cited in the field notes was acceptable. The three locations were resampled in January 2014, and the field QA/QC was acceptable. No tracer compound was detected greater than 20 ppbv.

The soil vapor data portion of the risk assessment included all compounds of concern (CoCs) associated with the fuel releases and CoCs not associated with the fuel releases. The release area and the repair shop area were evaluated separately for future residential use. Conservative residential parameters were used for evaluation of the building, including an air exchange rate of 0.25 [hr⁻¹], loam for the soil type and it being a 100 square meter house built slab-on-grade. The maximum concentrations for the CoCs in the soil vapor were evaluated. Compounds were eliminated from inclusion in the risk assessment if they were not present at levels above the laboratory reporting limit, were a common laboratory contaminant and found at levels less than 5 times the concentration found in the field blank, or if insufficient toxicity data is available. Toxicity data was obtained from the most recently available EPA Regional Screening Level table for residential air [November 2013]. The cancer risk (ELCR) and the hazard risk (HI) for the release areas were evaluated using the EPA's on-line version [forward calculation] of the Screening Level Johnson and Ettinger Model.

Using the J&E to model vapor data collected near the release area shows the ELCR does not exceed the 10⁻⁶ risk level. The HI is below 1. Using the J&E to model vapor data near the repair shop shows the ELCR does not exceed the 10⁻⁶ risk level. The HI is below 1. There is no vapor intrusion risk from either the soil or the groundwater contamination left in place.

As an ultra-conservative measure, the maximum groundwater contaminant concentration for benzene was modeled using the J&E to evaluate possible vapor intrusion issues. The ELCR and HI both show an acceptable risk level. It is noted that the model allows for groundwater data to be used, but soil vapor data is the preferred data for modeling.

Conclusions and Recommendations

Soil

Under A.A.C. R18-7-206(D), multiple contaminants, multiple pathways of exposure, uncertainty of exposure and sensitive populations are evaluated as part of a site specific risk assessment. The petroleum related soil contamination was only present in the subsurface, so there isn't a risk posed by the dermal or ingestion exposure routes. For the VOC contamination present in soils at depth in SB-1, the only potential exposure route is inhalation by vapor intrusion since the VOC that exceeded a regulatory standard was within the smear zone. The soil samples collected between 5 and 15 feet had no VOC contamination present over an applicable regulatory standard, so dermal contact and ingestion are not complete exposure pathways. The soil vapor survey demonstrates the inhalation exposure route shows an acceptable risk from any remaining VOC contamination left in subsurface soils. There are no sensitive receptors within the exposed population. Tetraethyl lead was not detected above the laboratory method reporting limit.

Groundwater

For alternative groundwater closure, several criteria under R 18-12-263.04 must be met. The contamination has been characterized and analytical data supports that the plume is stable and localized on-site. The groundwater was remediated using ORC, and the VOCs concentrations have significantly declined. The modeled soil vapor and groundwater data shows that there is no unacceptable vapor intrusion risk due to the soil and groundwater contamination left in place. The water that is impacted by VOC contamination over an applicable regulatory standard is not used as a potable water source. This contamination has not threatened or impacted any drinking water wells.

It is recommended that LUST releases 5493.01 and .02 be closed for the soil contamination under R18-12-263.03 and R18-7-206(D) and under R18-12-263.04 for the groundwater.

If there any questions regarding this memo, please contact me at dq1@azdeq.gov, or 771-4453.