

# Health Consultation

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LONE BUTTE INDUSTRIAL PARK – TCE

DISTRICT 4 MEMORIAL AREA  
GILA RIVER INDIAN COMMUNITY

MARICOPA COUNTY, ARIZONA

JANUARY 10, 2007

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Public Health Service  
Agency for Toxic Substances and Disease Registry  
Division of Health Assessment and Consultation  
Atlanta, Georgia 30333

## **Health Consultation: A Note of Explanation**

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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HEALTH CONSULTATION

LONE BUTTE INDUSTRIAL PARK – TCE

DISTRICT 4 MEMORIAL AREA  
GILA RIVER INDIAN COMMUNITY

MARICOPA COUNTY, ARIZONA

Prepared By:

Gila River Indian Community  
Department of Human Resources  
Office of Occupational Safety and Health Office  
Under Cooperative Agreement with the  
U.S. Department of Health and Human Services  
Agency for Toxic Substances and Disease Registry



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## Summary and Statement of Issues

The Gila River Indian Community (GRIC), Office of Occupational Safety and Health (OSH), through a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), has prepared this health consultation which serves to address health concerns at the Lone Butte Industrial Park in Memorial Area in District 4. This health consultation will evaluate the potential public health impact of TCE contamination of drinking water wells (production wells) situated on the Lone Butte Industrial Park (LBIP) site and west of Interstate 10 (I-10). Specifically, GRIC's intent is to review the available data and information for the site and make recommendations, if needed. Data available to the OSH office is presented in the background section, followed by a discussion of the health implications, if any, and then conclusions, and recommendations.

## Background

### Site Description and History

The Lone Butte Industrial Park is strategically located on the Gila River Indian Community in the Memorial Area. The site is east of I-10, west of Dan Jackson Drive, south of Chandler, Arizona and Loop 202 East. An aerial view of the site is located in Appendix B. The industrial park consists of 720 prime highway frontage acres; lots range in size from five to 20 acres. The site address is 6960 W. Allison Road, Chandler, Arizona. Eighty acres are retail/commercial and the remaining 640 acres are zoned as light and heavy industrial. The LBIP consists of approximately 31 tracts with multiple units in each tract. There are approximately 55 tenants. The site is approximately 50% developed.(1) The units in the industrial park are serviced by the LBIP drinking water wells (Well #1 and Well #2).

### Site Investigation

The Gila Floodway (GFW) groundwater-monitoring well was the first well to be installed in January of 2000. The GFW was specifically installed to monitor ambient background water quality in the subsurface beneath the GFW according to the Phase I Remedial Investigation of Trichloroethylene (TCE) LBIP report. The monitoring well is located east of the LBIP, one mile west of I-10 and the Wild Horse Pass Road/Sundust Road exchange. The GFW monitoring well is screened from 70 to 100 feet below the ground surface (bgs). A common chlorinated aliphatic hydrocarbon, TCE, was detected consistently and ranged from 8.4 to 25 micrograms per liter ( $\mu\text{g/L}$ ). The Maximum Contaminant Level (MCL) under the United States Environmental Protection Agency (USEPA) for TCE is 5  $\mu\text{g/L}$ .(2) TCE was mainly used as degreaser to clean metal parts.

MCLs are drinking water standards set by EPA in accordance with the Safe Drinking Water Act. MCLs are not health-based threshold levels. Instead, the MCLs include a substantial margin of safety to account for uncertainties in health studies and technology. Therefore, people ingesting chemicals at or slightly above MCLs should not experience any illness or other adverse health effects. For more information on MCLs and the EPA standard setting process, visit the EPA website at: <http://www.epa.gov/safewater/mcl.html>.



**Monitoring Wells**

An investigation was prompted to find the source of the contamination, and mitigate the potential impact to groundwater. To understand the site hydrogeologic setting and the distribution of contaminants the GRIC Department of Environmental Quality (DEQ) Water Quality Program (WQP) installed two additional groundwater-monitoring wells in August of 2002 (LB #1 and LB #2). (3)

In 2004 acetone was only detected once during the first round of sampling of groundwater from monitoring well LB-1. 1,1-DCE has an ATSDR Comparison Value (CV) of 0 µg/L and is a suspected carcinogen. Sampling results ranged from 2.3 µg/L. to 17 µg/L. PCE has a Maximum Contaminant Level (MCL) of 5 µg/L and is a suspected carcinogen. Sampling results ranged from 1.50 µg/L. to 2.92 µg/L. 1,4-Dioxane was only detected once during 2004 at 2.6 µg/L. (3)

TCE concentrations ranged from 9.2 µg/L to 34 µg/L in LB-1 and LB-2, respectively. Sampling results from September 2004 indicate that TCE well concentrations increased to 98 µg/L in the LB-2 monitoring well.

Two additional groundwater monitoring wells were installed in May of 2004 (Wells LB-3 and LB-4). In June 2004 samples TCE concentration ranged from 2.4 µg/L to 77 µg/L. Subsequent samplings in June and September 2004 detected benzene, tetrachloroethylene (PCE), and perchlorate. None of the VOC's have been detected in the drinking water wells at LBIP.

In February 2005 three additional monitoring wells were installed to better define the direction and gradient of groundwater flow and help gather additional data on the lateral distribution of contaminants, along with a possible source. See Appendix B for a view of wells LB-5, LB-6, and LB-7.

The TCE sample results from March 2005 ranged from:

LB5 Monitoring Well	from <0.50 µg/L to 4.7 µg/L
LB6 Monitoring Well	all samples <0.50 µg/L
LB7 Monitoring Well	from 0.60 µg/L to 11000 µg/L

The sampling results from the groundwater monitoring wells indicate that the groundwater plume covers approximately two square miles (1,280 acres).(3) Along with TCE, acetone, 1,1-dichloroethylene (1,1-DCE), 1,4-dioxane and perchlorate were found and are industrial chemicals and volatile organic compounds (VOC). Perchlorate contamination is covered in a separate health consultation of the Lone Butte Industrial Park site.

**Drinking Water Wells**

There are two drinking water wells on the LBIP site (Wells #1 and #2). No TCE or other VOC's have been detected to date in these wells. The wells are located in the northern part of the site. In addition, there are three drinking water wells down gradient from the GFW monitoring wells.

The Wild Horse Pass (WPH) north and south wells, and the Lone Butte Subdivision Water System well (LBSWS) are monitored by the GRIC Public Works Department (PWD). TCE has not been detected in these wells. Most of these production wells are screened several hundred feet below the land surface and do not produce from the same elevation currently being monitored for groundwater contamination. Monitoring wells are screened closer to the land surface. Further investigation is needed to determine the potential hydraulic connection between the groundwater contamination and the production wells (3)

OSH could not locate any soil sampling data when the site was assessed. Only groundwater and drinking water sampling was found during the site assessment. Therefore, only groundwater and drinking water sampling results will be evaluated in this health consultation.

## **Demographics**

According to data received from the LBIP development office, there are 2,500 employees who work at the industrial park. There are 55 tenants in the 31 occupied tracts at the LBIP. No children reside on the LBIP site. Interstate-10 is located 1 mile west from the site. There are 31 homes in a subdivision west of Interstate-10 with approximately 125 residents.

## **Community Health Concerns**

These are the concerns voiced by residents and the GRIC DEQ:

- **Community Concern:** A major concern of the surrounding residents and tenants of LBIP is that the TCE that has been found in the groundwater monitoring wells will contaminate the drinking water wells.
- **Response:** The drinking water wells are monitored on a quarterly basis. TCE has not been detected in the drinking water wells. If levels were to be detected over the MCL of 5 ppb, then the GRIC DEQ will assess the situation and act according to remedy any contamination issues. If TCE is detected in the drinking water wells, the monitoring will be conducted on a monthly basis.
- **Community Concern:** Potential contamination of subsequent drinking water wells, past the contaminated GFW monitoring well, that are situated across I-10 could be impacted in the future by TCE. These three production wells are northwest and are down gradient from the existing LBIP monitoring wells.
- **Response:** The drinking water wells are monitored on a quarterly basis. TCE has not been detected in the drinking water wells. If contaminants were to be detected, then the Public Works Department will assess the situation and act accordingly to remedy any contamination issues. If TCE is detected in the drinking water wells, the monitoring will be conducted on a monthly basis.

## **Discussion**

### **Exposure Pathway Analysis**

ATSDR's pathways analysis determines whether people have contacted contaminants from a site and whether those contacts were substantial enough to cause harm. To determine this, ATSDR identifies exposure pathways or ways in which a chemical can enter a person's body (i.e.,

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ingestion, inhalation, or dermal (skin) contact. An exposure pathway contains five major elements:

1. a source of contamination,
2. transport through an environmental medium,
3. a point of exposure,
4. a route of exposure, and
5. a receptor population.

If an exposure pathway contains all five elements and exists now or existed in the past, the pathway is considered complete. Only completed exposure pathways are evaluated to determine whether health effects could occur. If one or more of the five elements is not defined clearly but could exist, the exposure pathway is classified as potential.

Although TCE has been detected in all the monitoring wells, TCE has not been detected in the two drinking water wells that service the LBIP site (Wells #1 and #2), and the three wells down gradient from the GFW (the Wild Horse #1 and #2 and the LBSWS well). Because TCE has not been found in any of the drinking water wells there is no completed exposure pathway.

The GRIC Occupational Safety and Health Office will conduct additional health assessment activities as additional site related data becomes available.

### **ATSDR Child Health Considerations**

In communities faced with air, water, or food contamination, the many physical differences between children and adults demand special emphasis. Children could be at greater risk than are adults from certain kinds of exposure to hazardous substances. Children play outdoors and sometimes engage in hand-to-mouth behaviors that increase their exposure potential. Children are shorter than are adults; this means they breathe dust, soil, and vapors close to the ground. A child's lower body weight and higher intake rate results in a greater dose of hazardous substance per unit of body weight. If toxic exposure levels are high enough during critical growth stages, the developing body systems of children can sustain permanent damage. Finally, children are dependent on adults for access to housing, for access to medical care, and for risk identification. Thus adults need as much information as possible to make informed decisions regarding their children's health.

GRIC and ATSDR attempted to identify populations of children at the LBIP. According to the GRIC District Four Service Center, no children live on the industrial site. Although, TCE exceeded the MCL in monitoring wells, no TCE has been detected in the drinking water wells at the Lone Butte Industrial Park site; therefore there is no completed exposure pathway for children or adults.

### **Conclusions**

- No TCE contamination has been detected in drinking water wells at the LBIP, or down gradient drinking water wells. Because no TCE has been detected in any drinking water



wells, it currently poses no public health hazard. However, there is a potential for TCE to migrate into drinking water wells in the future.

- Based on the monitoring well results at LBIP and GFW, there is a potential for further migration of the TCE plume. The TCE found at the LBIP is suspected to be coming from a tract used by an old tenant at the site, from the old Aero Dyne Site and other multi-sources. There is a potential health hazard that the contaminated groundwater plume may migrate down gradient to the drinking water wells that service the WHP Casino and Lone Butte Subdivision in the future.

### Recommendations

- The Gila River Indian Community, Department of Environmental Quality (Hazardous Waste Program and WQP) and Department of Public Works (DPW) should continue conducting monthly samplings of the Lone Butte drinking water well and down gradient drinking water wells to ensure that TCE does not impact these wells at levels that would adversely impact public health.
- A site assessment is recommended by DEQ to determine full extent of contamination and remediation action, if needed.
- It is recommended that the Gila River Indian Community DEQ Hazardous Waste Program conduct soil sampling.

### Public Health Action Plan

The OSH has developed a public health action plan to ensure the recommendations are implemented and are meaningful for the affected residents. The public health action plan is described in the following table.

Public Health Action	Who Will Implement the Action	Time Frame for Implementation	Desired Outcome When Implemented	Public Health Impact
Continue to conduct sampling of Lone Butte Industrial Park drinking water well and monitoring wells for TCE	GRIC DEQ WQP/DPW	Monthly for TCE	Ensure safe drinking water to GRIC residents and LBIP tenants	Prevent exposure to TCE at levels that could harm health
Site assessment to be conducted	GRIC DEQ Water Quality Program	When project funded	Determine full extent of contamination and, if necessary, remediation action	Fully understand the migration, transport and fate, and select a remediation method, if needed, for the TCE contaminated plume to prevent further potential contamination
Conduct soil sampling	GRIC DEQ Hazardous Waste Program	When project funded	Knowledge of existing soil levels of TCE at Lone Butte Industrial Park site	Assure remediation action and prevent further potential contamination

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## Reviewers

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Gila River Indian Community  
Occupational Health and Safety Office

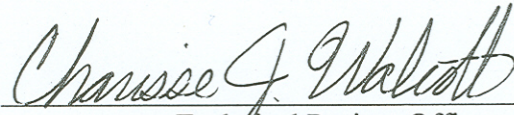
Eleanor R. Vargas, MST  
ATSDR Environmental Health Assessor  
Gila River Indian Community  
Occupational Health and Safety Office

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1. Lone Butte Industrial Park, 2005. Facilities and Amenities at Lone Butte Industrial Park, May. The site can be accessed at:  
<http://www.lonebutteindustrialpark.com/facilities.htm>
2. Agency for Toxic Substances and Disease Registry. Toxicological Profile for Trichloroethylene, Update. Atlanta: ATSDR, September 1997
3. Gila River Indian Community, Department of Environmental Quality, Water Quality Program, 2004. Phase I Remedial Investigation Report, TCE Investigation Site, by ATC Associate, Incorporation for Gila River Indian Community, Sacaton, Arizona, September 30.
4. Transwest Geochem Laboratory, 2005. ATC Associates Inc. sampling results from March 2006 for Gila River Indian Community/34.78005.0001 Work Order No. 0503027, March.
5. Environmental Protection Agency, 2005. Consumer Fact sheet on: TRICHLOROETHYLENE, May. The site can be accessed at:  
<http://www.epa.gov/safewater/dwh/c-voc/trichlor.html>

***Certification***

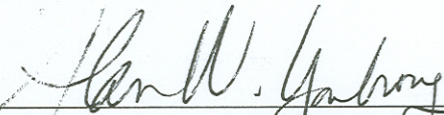
This Health Consultation for Lone Butte Industrial Park was prepared by the Gila River Indian Community (GRIC), Occupational Safety and Health (OSH) office, under the Cooperative Agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It was completed in accordance with the approved methodology and procedures existing at the time the health consultation was initiated. Editorial review was completed by the Cooperative Agreement partner.



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Technical Project Officer  
**CAT, CAPEB, DHAC, ATSDR**

The Division of Health Assessment and Consultation, ATSDR, has reviewed this Health Consultation and concurs with its findings.



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Team Leader - Cooperative Agreement  
**CAT, CAPEB, DHAC, ATSDR**

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## **Appendices**

**Appendix A: Acronyms and Abbreviations**

**Appendix B: Aerial Photos of Lone Butte Industrial Park site**

**Appendix C: Contaminant of Interest**

## **Appendix A: Acronyms and Abbreviations**

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## Acronyms and Abbreviations

1,1-DCE	1,1-dichloroethylene
ATSDR	Agency for Toxic Substance and Disease Registry
bgs	Below Ground Surface
CAH	Chlorinated Aliphatic Hydrocarbon
COC	Contaminant of Concern
DEQ	Department of Environmental Quality
EPA	Environmental Protection Agency
GFW	Gila Floodway Monitoring Well
GRIC	Gila River Indian Community
LBIP	Lone Butte Industrial Park
MCL	Maximum Contaminant Level
µg/L	Microgram per liter
NPL	National Priorities List
OSH	Occupational Safety, Health
PWD	Public Works Department
ppb	Parts per Billion
RfD	Reference Dose
TCE	Trichloroethylene
USEPA	United State Environmental Protection Agency
VOC	Volatile Organic Compounds
WQP	Water Quality Program

**Appendix B: Aerial Photos of Lone Butte Industrial Park site**



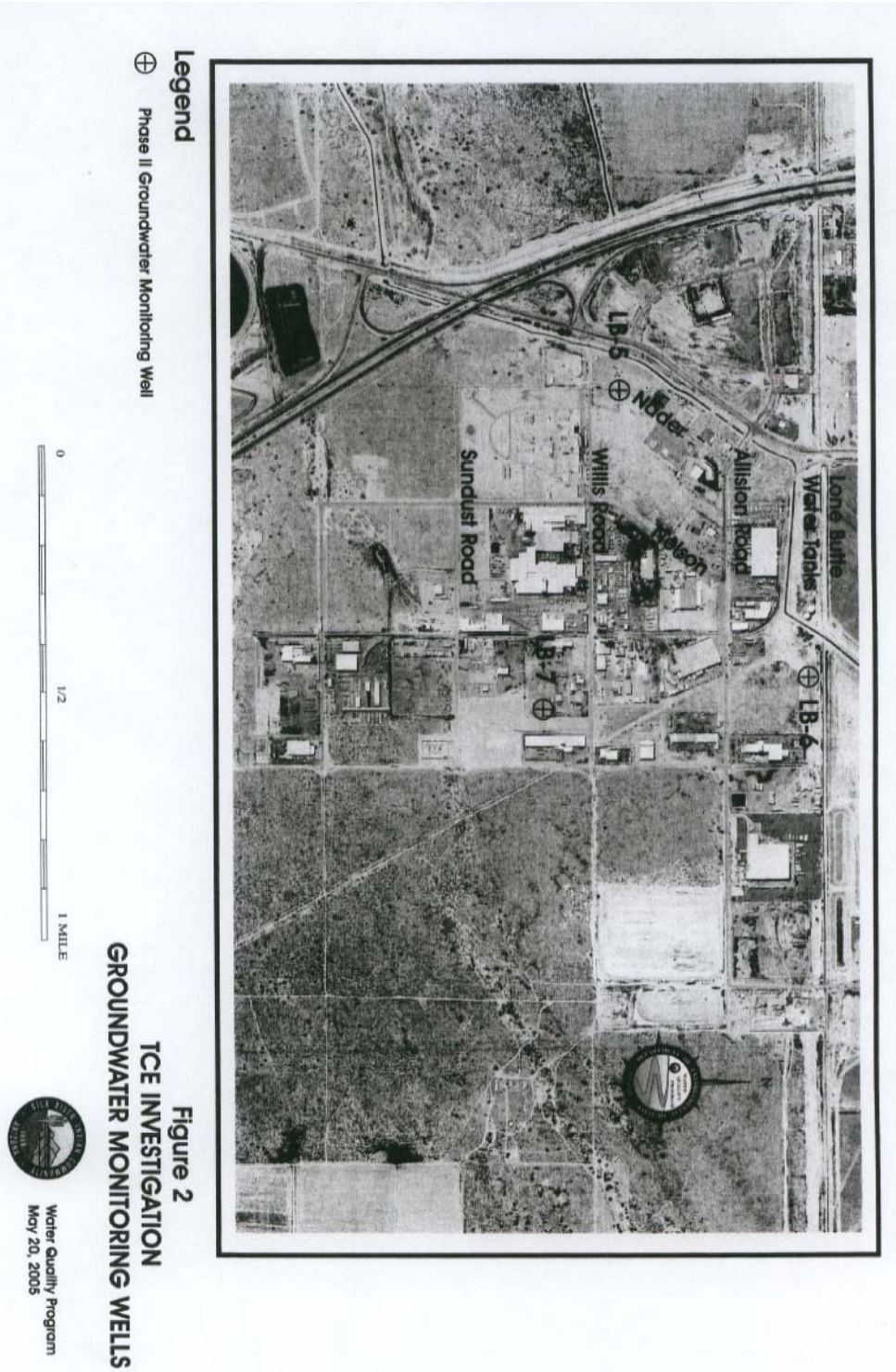
**Figure 1 –Lone Butte of Industrial Park site**



**Figure 2 - Aerial Photo of Lone Butte Industrial Park and Aero Dyne Corporation**



**Figure 3 –Lone Butte Industrial Park Site New TCE Investigation Groundwater Monitoring Wells-2005**



**Appendix C: Contaminant of Interest**

## **CONTAMINANT OF INTEREST**

### Trichloroethylene, (TCE)

Trichloroethylene (TCE) is a nonflammable, colorless liquid with a somewhat sweet odor and a sweet, burning taste. It is used mainly as a solvent to remove grease from metal parts, but it is also an ingredient in adhesives, paint removers, typewriter correction fluids, and spot removers.

Trichloroethylene is not thought to occur naturally in the environment. However, it has been found in underground water sources and many surface waters as a result of the manufacture, use, and disposal of the chemical

Drinking or breathing high levels of TCE may cause nervous system effects, liver and lung damage, abnormal heartbeat, coma, and possibly death. Trichloroethylene has been found in at least 852 of the 1,430 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA). The EPA maximum contaminant level (MCL) for TCE is 5 ppb. (2) EPA classifies TCE as a B2 carcinogen, which is a probable human carcinogen. The classification comes from inadequate human, but sufficient animal studies. Some people who drink water containing TCE in excess of the MCL over many years could experience liver problems and may have an increased risk of developing cancer.(5) The highest levels found at the LBIP monitoring wells come from the LB-7 well at 11000 µg/L in March 2005. The TCE exposure could possibly cause these mentioned health effects if found in drinking water well.