

Health Consultation

Phoenix Goodyear Airport Superfund Site

TIERRA VERDE LAKE

CITY OF LITCHFIELD PARK, MARICOPA COUNTY, ARIZONA

EPA FACILITY ID: AZD980695902

JUNE 13, 2008

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

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TIERRA VERDE LAKE

CITY OF LITCHFIELD PARK, MARICOPA COUNTY, ARIZONA

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Prepared By:

Arizona Department of Health Services
Office of Environmental Health
Environmental Health Consultation Services

Under a Cooperative Agreement with the
U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Purpose

The Arizona Department of Health Services (ADHS) received a request for a Health Consultation from the City of Litchfield Park, dated March 5, 2007. The nature of the request was for ADHS to determine if there was a risk to public health from eating fish taken from Tierra Verde Lake. The City sponsors an annual fishing derby (appendix 1) and believed that some citizens were eating the fish they caught. The City tested their lake water and for the very first time, measurable amounts of perchlorates were detected. The probable source for the perchlorates was thought to be from a groundwater, contaminant plume originating from the Phoenix Goodyear Airport (PGA) Superfund Site.

Background and Statement of Issues

The City of Litchfield Park has a population of 3,810 with 1,633 housing units, and covers an area of 3.13 square miles (US Census Bureau, Census 2000). In December of 2000, a Public Health Assessment was published for the Litchfield Airport Area (a.k.a. Phoenix Goodyear Airport-“PGA”). The *Envirofact* map (appendix 2) shows the location of this site with an orange square. This site bears the Environmental Protection Agency (EPA) Superfund identifier: AZD980695902. From 1963-1974, hazardous waste was produced and disposed upon this Unidynamics property. The site was put on the National Priority List (NPL) in 1983. The Crane Company currently owns the property and is responsible for the cleanup. Trichloroethylene (TCE) and perchlorates are both chemicals of concern present in the plume originating from the PGA Superfund site. This plume of contaminated ground water has migrated 2+ miles to the north of this site. The dashed, black line on the Arcadis map (appendix 3) represents the Subunit A, TCE plume boundary, based on 05/07 data.

Exposure Evaluation

Water Quality Monitoring Data

The EPA contracted with CH2M Hill to conduct hydrologic studies to track and determine the extent of contaminated groundwater plumes from the PGA site. A map (Subunit A TCE Concentration 2nd Quarter 2007, PGA North Superfund, appendix 3) indicates that Tierra Verde Lake is just north of the *Inferred Subunit A TCE Plume Boundary*. Table 1 shows TCE concentrations in water samples taken from a monitoring well located in a shallow aquifer just 1,200 feet south of the Lake. TCE was being used as a chemical indicator for all contaminants (including perchlorates), emanating from the Superfund Site.

Table 1. Trichloroethylene (TCE) Concentrations (parts per billion, ppb) detected in EPA Monitoring Well-18A, 9/1/06-5/2/07, Arcadis 2007

Date	Trichloroethylene (ppb)
09/01/2006	7.3
10/05/2006	1.2
11/08/2006	4.4
12/15/2006	<1.0
01/08/2007	<1.0
02/14/2007	<1.0
03/06/2007	<1.0
03/06/2007	<1.0
04/03/2007	<1.0
05/02/2007	1.2

Trichloroethylene (TCE) is another chemical of concern in the plume originating from the Phoenix Goodyear Airport Superfund site. It was originally thought that it too would eventually show up in Tierra Verde Lake. It is important to note that no measurable concentration of TCE was detected in samples taken from either the well which is used to fill the lake, or the lake itself.

Twelve water samples were collected from both the lake and the well which supplies water to the lake. The results of this sampling are presented in Table 2. The well is adjacent to the lake and draws water from a shallow aquifer. This sampling was done between 12/1/06 through 2/9/07. Eight of the samples were analyzed by Aerotech Environmental Laboratories using method 314. The minimum reporting levels for seven of these samples were 1.0 parts per billion (ppb) perchlorate. One sample had a minimum reporting level of 2 ppb, and the analysis for this sample was “estimated” to be 1.5 ppb. Four of the samples were analyzed by Severn Trent Laboratories, Inc. of Savannah, GA. Two of these samples used laboratory method 332.0, with a minimum reporting level of 0.20 ppb. The highest sampling result using this method was 1.1 ppb perchlorate. Table 2 summarizes the monitoring results.

Table 2 Tierra Verde Lake and Well Perchlorate Sample Results 2006-2007

Chemical	Sample ID	Method	Sampled Date	Minimum Reporting Limit	Well Supplying Water to the Lake (ppb)	Tierra Verde Lake (ppb)
Perchlorate (ClO ₄ ⁻)	680-24348-1	332.0	02/09/07	0.2	1.1	
	680-24348-2	332.0	02/09/07	0.2		0.81
	07020294-01A	E314	02/09/07	1.0	< 1.0	
	07020294-02A	E314	02/09/07	1.0		<1.0
	06120015-01A	E314	12/01/06	1.0	< 1.0	
	G6L200267-001	MCAWW314	12/15/06	1.0	0.47	
	G6L200267-002	MCAWW314	12/15/06	1.0		ND ^a
	G7A110256-001	MCAWW314	01/10/07	1.0	1.0	
	G7A110256-002	MCAWW314	01/10/07	1.0		ND
	06120029-01A	E314	12/01/06	2.0	< 2.0	
	06120029-03A	E314	12/01/06	2.0	< 2.0	
	LP-894-12152006-4	MCAWW314	12/15/06	2.0	1.0	
	LTL-12152006-5	MCAWW314	12/15/06	2.0		ND
	G7A110250-7	MCAWW314	01/10/07	2.0	1.5	
Average					0.897 ^b	0.662 ^b

^a ND: non-detect

^b If the detected perchlorate concentration is indicated as ND (i.e. < 1.0 or < 2.0 ppb), the concentration was assumed to be ½ of the minimum reporting limit

Exposure Pathway Evaluation

ADHS identifies the exposure pathways to determine if and how the public might be exposed to chemicals in the water. There are five elements considered in the evaluation of an exposure pathway:

- *A source of contamination*
- *Transport through an environmental medium*
- *A point of exposure*
- *Route of exposure*
- *A receptor population*

Exposure pathways are classified as complete, potential, or eliminated. Completed pathways exist when the five elements are present and indicate that exposure to a contaminant has occurred in the past and/or is occurring now. Potential pathways are those that may have occurred in the

past, present, or could occur in the future. In eliminated pathways, at least one of the five elements is missing, and will never be present. Completed and potential pathways, however, may also be eliminated when the concentration of contaminants is not likely to cause harm.

Potential exposure pathways may result from people catching and eating fish from the lake, along with incidental ingestion and/or contact with the water (Table 3).

Table 3. Exposure Pathways

Exposure Pathway Elements					Time	Type of Exposure Pathway
Source	Media	Point of Exposure	Route of Exposure	Estimated Exposed Population		
Contaminated Groundwater	Fish caught from Tierra Verde Lake	Man made urban lake; Residences	Ingestion	3,810 Residents	Past	Potential
					Current	Potential
					Future	Potential
Contaminated Groundwater	Tierra Verde Lake Water	Man made urban lake	Incidental ingestion; Incidental dermal contact	3,810 Residents	Past	Potential
					Current	Potential
					Future	Potential

Health Effects Evaluation

ADHS assesses a site by evaluating how people may be exposed to chemicals at levels capable of producing adverse health effects. A pathway defines how a chemical may enter a person's body and potentially cause illness. This evaluation includes use of comparison values (CVs), which are screening tools used along with environmental data relevant to the exposure pathways. CVs are conservatively developed and are based on the most current scientific data, and give consideration the most sensitive groups (e.g. children).

If public exposure concentrations related to a site are below the corresponding CV, then the exposures are not considered to be of a public health concern, and no further analysis is conducted. However, while concentrations below the CV are not expected to lead to any observable adverse health effect, it should not be inferred that a concentration greater than the CV will necessarily lead to adverse health effects. Depending on site-specific environmental exposure factors (e.g. duration and amount of exposure) and individual human factors (e.g. personal habits, occupation, and/or overall health), exposure to levels above the comparison

value may or may not lead to a health effect. Therefore, the CVs should not be used to predict the occurrence of adverse health effects.

The Arizona Health-Based Guidance Level (HBGL) and ATSDR's chronic Environmental Media Evaluation Guide (EMEG) for child are used in the screening analysis. HBGLs and EMEGs are developed based on conservative assumptions about exposure. These values represent concentrations of substances in water, soil, or air to which daily human exposure is unlikely to result in the adverse health effects. HBGL for perchlorate is 14 ppb and child EMEG for perchlorate is 7 ppb. None of the measured perchlorate concentrations is exceeding HBGL or child EMEG. Therefore, residents should not experience adverse health effects from incidental ingestion or incidental dermal contact with the Tierra Verde Lake water.

Perchlorate salts are water soluble and persistent in the environment. It has been detected in a variety of fish (Smith et al. 2001; Theodorakis et al. 2006). Hence, there is a possibility that humans are exposed to perchlorate by consumption of contaminated fish. Yet, no attempt has been made to measure perchlorate concentrations in fish caught from Tierra Verde Lake. To evaluate the potential health effects due to fish consumption, ADHS reviewed available literature. Bradford et al. (2006) and Liu et al. (2006) investigate the uptake, accumulation and depuration of perchlorate in fish. The studies indicate that the uptake and accumulation of perchlorate are dose-dependent. In addition, perchlorate was not detected in adult mosquitofish exposed to low concentrations of perchlorate (0, 0.1 and 1 ppm sodium perchlorate; 1ppm = 1,000 ppb), regardless of the exposure time. The detected perchlorate concentrations in the Tierra Verde Lake and wells supplying water to the lake are less than 0.1 ppm. Therefore, fish in Tierra Verde Lake may not contain detectable perchlorate.

ADHS also estimates the perchlorate uptake from fish consumption to determine if there is a public health hazard. Liu et al. (2006) indicates steady state of perchlorate accumulation can be reached within 10 days. The bioconcentration factors (BCF = perchlorate concentration in fish tissue / perchlorate concentration in the water) were at a range from 0.06 to 0.35 (Bradford 2006; Liu 2006). Based on this, ADHS estimated the fish concentrations range from 0.000054 to 0.00031 mg/kg (i.e. 0.054 ~ 0.31 ppb). The estimated daily uptake rates range from 1.9×10^{-8} to 1.1×10^{-7} mg/kg/day by assuming a consumption rate of 0.025 kg/day for recreational fishers (EPA 1999). The estimate daily uptake rates do not exceed the ATSDR minimum risk level for perchlorate which is 0.0007 mg/kg/day. Therefore, residents are not likely to develop perchlorate-related illnesses by consuming fish caught from Tierra Verde Lake.

ATSDR Child Health Concern

ATSDR recognizes that the unique vulnerabilities of infants and children require special emphasis in those communities faced with contaminants in environmental media. A child's developing body systems can sustain permanent damage if toxic exposures occur during critical growth stages. Children ingest a larger amount of water relative to body weight, resulting in a higher burden of pollutants. Furthermore, children often engage in vigorous outdoor activities, making them more sensitive to pollution than healthy adults. All health analyses in this report take into consideration the unique vulnerability of children.

Conclusions

- Based on the available information, ADHS has concluded that there is **no apparent public health hazard** from perchlorates stemming from incidental water ingestion or incidental dermal contact.
- Based on the available information, ADHS has concluded that there is **no apparent public health hazard** from the consumption of fish caught from Tierra Verde Lake.

Recommendations

- It would be prudent to keep monitoring both the lake and well water to assure the public that the perchlorate levels are not increasing and TCE's are not present. At this time, the Arizona Department of Health Services can find no reason to prohibit fishing at the Tierra Verde Lake.

Public Health Action Plan

- ADHS will post this finalized Health Consultation on its internet site. Also, copies of this report will be sent to the City of Litchfield Park
- ADHS will provide community health education to citizen groups in Litchfield Park upon request
- ADHS will continue to evaluate any new water quality data obtained by the City
- ADHS will evaluate any laboratory data resulting from the analysis of fish taken from Tierra Verde Lake
- If future changes in the water quality indicate a need to revise the current conclusion, another Health Consultation will be prepared, and all stakeholders will be informed

References

Arcadis, Subunit A TCE Concentration 2nd Quarter 2007, PGA North Superfund Site, 2007 Phoenix, AZ.

ATSDR, Toxicological Profile for Perchlorates, September 2005. U.S. Department of Health and Human Services, Atlanta, GA

ATSDR, Public Health Assessment for Litchfield Airport Area, EPA Facility ID: AZD 98069502, December 18, 2000, U.S. Department of Health and Human Services, Atlanta, GA

Aerotech Environmental Laboratories, Litchfield Park Well/101003, 12/15/2006. Phoenix, AZ

Aerotech Environmental Laboratories, Litchfield Park Well/101003, 1/30/2007. Phoenix, AZ

Aerotech Environmental Laboratories, Litchfield Park Well/101003, 1/12/2007. Phoenix, AZ

Aerotech Environmental Laboratories, Litchfield Park Well/101003, 3/2/ 2007. Phoenix, AZ

Bradford, CM et al. (2006) Uptake and elimination of perchlorate in eastern mosquito fish. Chemosphere 63, 1591-1597.

Envirofacts 2007. http://oaspub.epa.gov/enviro/ef_home3.

Greer, M.A., et.al., Health Effect Assessment for Environmental Perchlorate Contamination. *Environmental Health Perspective* 110:927-937.

Liu, FJ et al. (2006) Uptake, accumulation and depuration of sodium perchlorate and sodium arsenate from zebrafish (*Danio rerio*). *Chemosphere* 65, 1679-1689.

Smith, PN, Theodorakis, CW, Anderson, TA, Kendall, RJ. (2001) Preliminary assessment of perchlorate in ecological receptors at the Longhorn Army Ammunition Plant. LHAAP, Karnack, Texas. *Ecotoxicology* 10, 305-313.

Theodorakis, C, Richard, J, Todd, T, Liu, F, Park, J, Costa, F, McDaniel, L, Kendall, R, Waters, A (2006) Perchlorate in fish from a contaminated site in east central Texas. *Environ Pollut* 139, 59-69.

US Census Bureau, Census 2000. <http://www.census.gov/>

US EPA (1999) Exposure Factors Handbook. Office of Research and Development. EPA/600/C-99/001. February

Prepared by

Alan Croft, MPH, Health Risk Assessor
Jennifer Botsford, MSPH, Program Manager

Risk Assessment & Health Consultation Program
Office of Environmental Health
Bureau of Epidemiology and Disease Control
Arizona Department of Health Services

ATSDR Regional Representative

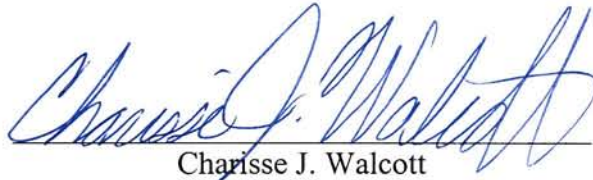
Gwen Eng
Office of Regional Operations, Region IX
Office of the Assistant Administrator

ATSDR Technical Project Officer

Charisse J. Walcott
Division of Health Assessment and Consultation
Cooperative Agreement Program Evaluation Branch
Cooperative Agreement Team

Certification

This Health Consultation entitled, *Tierra Verde Lake, City of Litchfield Park, Maricopa County, Arizona* was prepared by the Arizona Department of Health Services under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was initiated. Editorial review was completed by the cooperative agreement partner.



Charisse J. Walcott
Technical Project Officer
Cooperative Agreement Program Evaluation Branch
Division of Health Assessment and Consultation

The Division of Health Assessment and Consultation, Agency for Toxic Substance and Disease Registry, has reviewed this health consultation and concurs with its findings.



Alan Yarbrough
Team Leader, Cooperative Agreement Team
Cooperative Agreement Program Evaluation Branch
Division of Health Assessment and Consultation
Agency for Toxic Substance and Disease Registry

Appendix 1

City of Litchfield Park “Fishing Derby”

(<http://www.litchfield-park.org/photogallery.htm>)

Appendix 2

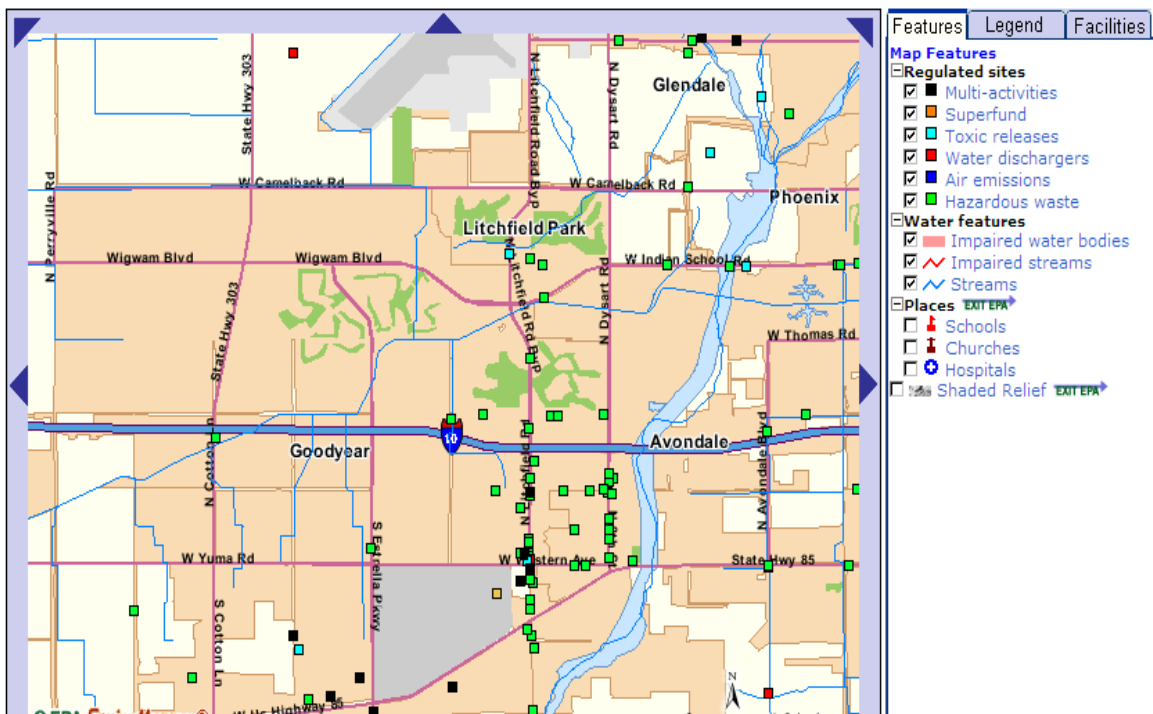


U.S. Environmental Protection Agency

EnviroMapper for Envirofacts

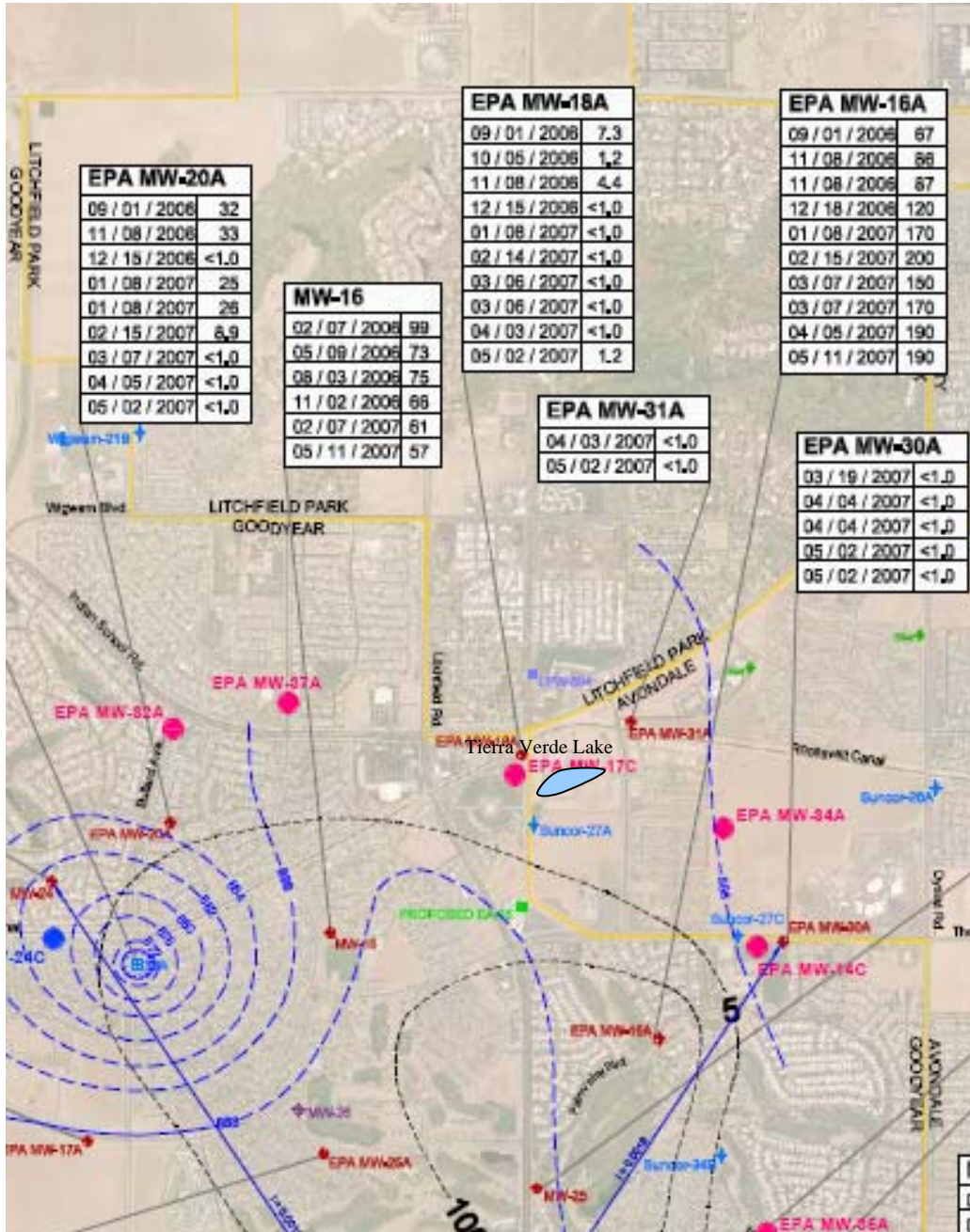
Contact Us

EPA Home > EnviroMapper > EnviroMapper for Envirofacts > Mapping Result



Source: Envirofacts 2007. http://oaspub.epa.gov/enviro/ef_home3.

Appendix 3



Arcadis, Subunit A TCE Concentration 2nd Quarter 2007, PGA North Superfund Site



DOCS\City Manager\3.7.07 Press Release

PRESS RELEASE

**For Immediate Release Contact: Darryl H. Crossman
June 21, 2007 City Manager
City of Litchfield Park
(623) 935-5033
Litchfield Park Re-Opens Tierra Verde Lake to Fishing**

The City of Litchfield Park has been monitoring the water in the well and lake at Tierra Verde Lake Park since November, 2006, in response to a public health concern related to the Phoenix-Goodyear Airport North (PGA-North) Superfund Site. The City learned last fall that the plume of groundwater contamination from the PGA-North site is spreading north and northeast toward the City of Litchfield Park.

In March, 2007, water samples at the Tierra Verde Lake Park well and the urban lake revealed detectable concentrations of potassium perchlorate. Potassium perchlorate is known to interrupt the thyroid's ability to properly utilize iodine to produce thyroid hormones and, therefore, inhibits the function of the thyroid.

Although the detectable concentration levels of potassium perchlorate in the well and lake were below the recognized guidelines, the City of Litchfield Park requested that the Arizona Department of Health Services (ADHS) conduct a public health consultation to determine if there was any risk to its citizens due to potential exposure to potassium perchlorate in the lake water or via uptake by consuming fish caught in the lake. Since March 7, 2007, fishing at the lake was suspended pending the findings by ADHS.

The Arizona Department of Health Services informed the City today that it can find no reason at this time to prohibit fishing at the Tierra Verde Lake; as such activity poses no apparent public health hazard to the citizens of the community. However, ADHS stated that it would be prudent to keep monitoring the lake water to assure the public that the perchlorate levels are not increasing. Signs prohibiting fishing at the lake will be removed.

"I am satisfied with the research by ADHS and its findings. We took a conservative approach to the issue due to the unknown effect of the detected contamination upon the lake and any potential impact upon its fish and fowl," said Darryl H. Crossman, City Manager of Litchfield Park. "We appreciate the community's support during the investigation, and pursuant to the suggestion by ADHS, we will continue to monitor the well and the lake so as to protect the safety, health and welfare of our community." For further information, contact City Manager Darryl H. Crossman at (623) 935-5033.

ToxFAQs™ for Perchlorates

CAS#: #10034-81-8, 7778-74-7, 7790-98-9, 7601-89-0, 7791-03-9

Highlights

Solid perchlorates are very reactive chemicals that are used mainly in fireworks, explosives, and rocket motors. The general population may be exposed to perchlorate from contaminated drinking water, food, and milk. High levels of perchlorate can affect the thyroid gland, which in turn can alter the function of many organs in the body. Developing organisms can be especially susceptible. The Environmental Protection Agency (EPA) reported that perchlorate has been found in 40 of the 1547 National Priority List sites.

What are perchlorates?

Perchlorates are colorless salts that have no odor. There are five perchlorate salts that are manufactured in large amounts: magnesium perchlorate, potassium perchlorate, ammonium perchlorate, sodium perchlorate, and lithium perchlorate. Perchlorate salts are solids that dissolve easily in water. The health effects of perchlorate salts are due to the perchlorate itself and not to the other component (i.e., magnesium, ammonium, potassium, etc.).

One place where perchlorate occurs naturally is in saltpeter deposits in Chile, where the saltpeter is used to make fertilizer. In the past, the United States used a lot of this fertilizer on tobacco plants, but now uses very little. Perchlorates are very reactive chemicals that are used mainly in explosives, fireworks, and rocket motors. The solid booster rocket of the space shuttle is almost 70% ammonium perchlorate.

Perchlorates are also used for making other chemicals. Many years ago, perchlorate was used as a medication to treat an over-reactive thyroid gland.

What happens to perchlorate when it enters the environment?

- Normally, perchlorate does not remain in soil because it washes away with rain water. However, in arid environments, it may remain in soil to provide a potential for dermal exposure.
- Perchlorate will eventually end up in ground water.
- We do not know exactly how long perchlorate will last in water and soil, but the information available indicates that it is a very long time, that is, many years.
- Perchlorates have been found in milk and food.

How might I be exposed to perchlorate?

Perchlorates entered the environment where rockets were made, tested, and taken apart. Factories that make or use perchlorates may also release them to soil and water.

- Drinking water that is contaminated with perchlorate. Most contaminated water supplies are found near sites where perchlorate has been found.
- Eating food, including milk, contaminated with perchlorate.
- Living near factories that make fireworks, flares, or other explosive devices, or living near a waste site or a rocket manufacturing or testing facility.

- Smoking or chewing tobacco may expose you to perchlorates because a variety of tobacco products contain perchlorate.

How can perchlorate affect my health?

Perchlorate affects the ability of the thyroid gland to take up iodine. Iodine is needed to make thyroid hormones that regulate many body functions after they are released into the blood. Perchlorate's inhibition of iodine uptake must be great enough to affect the thyroid before it is considered harmful. Healthy volunteers who took about 35 milligrams (35 mg) of perchlorate every day for 14 days showed no signs of abnormal functioning of their thyroid gland or any other health problem; however, it did inhibit iodide uptake by the thyroid. Studies of workers exposed for years to approximately the same amount of perchlorate found no evidence of alterations in the worker's thyroids, livers, kidneys, or blood. However, there is concern that exposure of people to higher amounts of perchlorate for a long time may lower the level of thyroid activity leading to hypothyroidism. Low levels of thyroid hormones in the blood may lead to adverse effects on the skin, cardiovascular system, pulmonary system, kidneys, gastrointestinal tract, liver, blood, neuromuscular system, nervous system, skeleton, male and female reproductive system, and numerous endocrine organs. Studies in animals also have shown that the thyroid gland is the main target of toxicity for perchlorate. Animal studies provided inconclusive results regarding effects of perchlorate on the immune system. Perchlorate did not affect reproduction in a study in rats.

How likely is perchlorate to cause cancer?

There are no adequate studies of exposure to perchlorate and cancer in humans. Long-term exposure to perchlorate induced thyroid cancer in rats and mice, but there are reasons to believe that humans are less likely than rodents to develop this type of cancer. The National Academy of Sciences (NAS) concluded that based on the understanding of the biology of human and rodent thyroid tumors, it is unlikely that perchlorate poses a risk of thyroid cancer in humans. Perchlorate has not been classified for carcinogenic effects by the Department of Health and Human Services (DHHS), the EPA, or the International Agency for Research on Cancer (IARC).

How can perchlorate affect children?

Children are more likely to be affected by perchlorate than adults because thyroid hormones are essential for normal growth and development.

Perchlorate has been found in breast milk. Limited studies of thyroid function of babies and young children whose mothers were exposed to perchlorate in their drinking water have not indicated thyroid abnormalities associated with perchlorate. Studies in animals have shown that perchlorate can alter the thyroid gland in the newborn animals. Studies in rats also found alterations in the brain from pups born to rats exposed to perchlorate while pregnant; however, as rats are more sensitive to agents that disturb thyroid function than are humans, the relevance of rat studies to humans is limited.

How can families reduce the risk of exposure to perchlorate?

- It is very unlikely that perchlorate is present in the average home or apartment.
- Use bottled water if you live near an area where perchlorate has been found and you have concerns about the presence of perchlorate in your tap water.
- Prevent children from playing in dirt or eating dirt if you live near a waste site that has perchlorates.

- Contact local water purveyors, health agencies, state environmental agencies, or EPA regional offices if you have any questions.

Is there a medical test to show whether I've been exposed to perchlorate?

There are no routine medical tests to measure perchlorate in the body, but it can be measured in the urine with special tests. Because perchlorate leaves the body fairly rapidly, perchlorate in urine only indicates recent exposure and is not an indication of any adverse health effects.