

Health Consultation

BROWNSBURG CONSERVATION CLUB

BROWNSBURG, HENDRICKS COUNTY, INDIANA

EPA FACILITY ID:

JUNE 17, 2004

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 document has previously been released for a 30 day public comment period. Subsequent to the public comment period, ATSDR addressed all public comments and revised or appended the document as appropriate. The health consultation has now been reissued. 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

BROWNSBURG CONSERVATION CLUB

BROWNSBURG, HENDRICKS COUNTY, INDIANA

Prepared by:

Indiana State Department of Health
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

Background and Statement of Issues

The Brownsburg Conservation Club is a gun club and shooting range located southwest of Brownsburg, Indiana. Residents of the area held a neighborhood meeting in 1999 because of their concerns about the site. Staff members of the Indiana Department of Environmental Management (IDEM) attended the meeting. In response to citizens' concerns, IDEM began conducting a site investigation in November 1999.

The Indiana State Department of Health (ISDH) provided followup to the issue of elevated lead levels that were detected in November of 1999 in the private well of a resident near the Brownsburg Conservation Club. This health consultation discusses whether the residents living in the home are consuming water from the well and also evaluates the health implications of exposure to lead at the levels found.

In April 2000, ISDH completed a health review of the issue and sent a letter to IDEM with the health review and recommendations. The recommendations included suggestions for reducing or eliminating lead exposure from the private well in question and also recommended follow-up sampling.

IDEM and ISDH confirmed that the persons living in the house with the elevated levels of lead in well water were using bottled water at that time. The residents had been in the home for approximately 2 years and had used the well water for an unknown amount of time before the contamination was detected. IDEM recommended drilling a deeper well to address the contamination problem. The house was built in the 1960s, and well records indicate that the well was drilled at a depth of approximately 60 feet. The house in question was unoccupied for an unknown number of years before the current residents took occupancy.

IDEM's site investigation included sampling water from the well used by the Brownsburg Conservation Club. Analytical sampling results of the BCC well water found no detectable levels of lead in the club's well water. Another goal was to attempt to identify the source of the elevated levels of lead that were found in one residential well. Other citizens of the area were concerned that their private wells might be contaminated with lead potentially emanating from the shooting range on the BBC site. Between November 1999 and June of 2000, IDEM sampled 12 residential wells in the neighborhood around the BCC. A few private wells were found to contain low levels of lead. Most wells were tested once during this period. The residence with confirmed high levels of lead was sampled several times. The pH of the well water was not taken and is unknown for the area. The pH influences solubility of metals and mobility in groundwater.

The Brownsburg Conservation Club is a gun club and shooting range that has existed since the late 1940s. The club is in Brownsburg, Hendricks County, Indiana, and is located on the east side of County Road (CR) 575 East and south of CR 350 North. The club is still in operation and serves not only Hendricks County, but also the greater Indianapolis area and surrounding areas. There is no open access to the site, and entrance is through a locked gate. The site is at a lower elevation and southeast of the private well that was found to have the higher levels of lead. BCC is north of White Lick Creek, a relatively narrow, nonrecreational body of water, which flows south and then east (See Figure 1). This site is not on EPA's National Priorities List (NPL).

The town of Brownsburg has a population of 14,520, according to U.S. Census 2000 data. The BCC is in a mostly rural area south of Brownsburg. Approximately 1,200 people live within a 1-mile radius of the club, and about 120 children are included in that number. The site is bounded on the north by residential properties and farmland and to the south by farmland and one residential property. A subdivision lies approximately ¼-mile northeast of the site. To the west is more farmland and sparse, single-family housing.

City water lines are on the north side of County Road 350 North and on the northeast side of County Road 575 East, but most houses in this area use private well water. Land use in this rural area is largely agricultural, interspersed with residential properties.

Currently, no one is impacted by the lead contamination at the house where the higher levels of lead were detected in the well water. The house is approximately 350 feet north of the BCC. The house sits on a hill and is the only residence in the immediate vicinity of the site. In July 2003, a certified letter was mailed to the owner of the contaminated private well to inquire about the family's water usage and to inform the residents that they could have their have their blood-lead levels tested through the Hendricks County Health Department. The owner telephoned ISDH in response to the letter and provided information about water usage. Two adults currently reside in the home. No children live there, although a teenager had recently left home. The residents were not using the well water for drinking or cooking purposes. The owner also stated that the house has been served by a reverse-osmosis water filtration system since January 2001. The owner maintains the system. Two outside spigots are not filtered, but are only used for washing vehicles.

The well at the house is approximately 60 feet deep. Nearby wells range in depth from 35 to 225 feet. Because the terrain is hilly and the contaminated well sits upon a hill, the depth to the contamination in other areas and the extent of contamination are difficult to determine without a hydrogeologic investigation. Because of that, comparison with wells of similar depths cannot be made. Depth of the on-site BCC well is unknown. Attempts to determine if a well log was available were unsuccessful.

Discussion

Twelve residential wells within the vicinity of the site, including the lead-contaminated well in question, were analyzed for lead. A summary of the sampling results for several of these wells is shown in Table 1. Well locations are shown in Figure 2. No lead was found in the well on the BCC site. Of the remaining wells sampled, two other wells were found to contain lead, both below the EPA action level of 0.015 parts per million (ppm). In March 2000, a sample was taken from a natural spring, uphill of White Lick Creek, on the property where the elevated lead is in the well. No lead was detected in the sample.

To determine whether lead pellets deposited from shooting activities had affected the creek or surface water quality, surface water and sediment samples were taken from White Lick Creek. Surface water had very low levels of lead; sediment samples were found to contain lead at approximately 3.5 ppm. This information is also summarized in Table 1.

Table 1. Brownsburg Conservation Club and Surrounding Area Sample Results.

Date Sampled	Location Number	Sample Type	Sample Result (parts per million)	Exceeded Action Level or RISC Value*
November 1999	1	Residential well	0.14	Yes
November 1999	2	Residential well	ND [†]	No
November 1999	5	Residential well	ND	No
November 1999	6	Residential well	ND	No
November 1999	7 (BCC)	Residential well	ND	No
November 1999	White Lick Creek	Surface water	0.003	No
November 1999	White Lick Creek	Sediment	3.7 ^{‡§}	No
November 1999	Downstream from BCC	Surface water	ND	No
November 1999	Downstream from BCC	Sediment	3.3 [‡]	No
February 2000	1	Residential well	0.0018 [§]	No
March 2000	1	Residential well, east tank, unpurged	0.0062	No
March 2000	1	Residential well, east tank, purged	0.029	Yes
March 2000	1	Outside faucet, unpurged	0.18	Yes
March 2000	1	Outside faucet, purged	0.0058 [§]	No
March 2000	1	Natural spring on property	ND	No
March 2000	4	Residential well	0.0058	No
June 2000	3	Residential well	0.0062	No
June 2000	4	Residential well, prior to softener	ND	No

* Action level of 0.015 ppm is from EPA Drinking water standards (at tap); value of 400 ppm for sediment is from IDEM Risk Integrated System of Closure (RISC) guidelines for residential soil

[†] ND = none detected

[‡] Estimated value

[§] Value based on average of duplicate sampling

After several rounds of sampling in 2000 and a visual inspection of topography, IDEM concluded that the BCC site is not a likely source of the lead contamination of the private well nearby. A citizen requested a second opinion from the U.S. Environmental Protection Agency (EPA). EPA agreed that the contaminated well appears to be upgradient from BCC, which suggests that BCC was not the source of the lead contamination. No hydrogeologic investigation was conducted to confirm the findings, and no further actions were planned for the site.

Earlier sample rounds suggested that lead in water pipes might be the source of the lead contamination. However, results of later sampling rounds did not support that theory. During one sampling round, the pump was pulled out of the well, and a water sample was taken directly from the aquifer. The highest levels to that date were obtained. Two samples were taken. One sample was filtered and the other was not filtered. The

nonfiltered sample contained 0.145 ppm of lead. The filtered sample did not contain lead. The conclusion drawn from this sampling was that all of the lead was removed by the filtering. IDEM deduced that lead was not in solution or dissolved and was attached to the solid particles within the water. This would indicate that exposure to lead in private well water would be eliminated by an effective filtering process. However, people who have no information about the possibility of lead in drinking water probably do not use filters for their well water; if they do use filters, the filters may not adequately remove lead. Individuals who may move into houses served by private wells near the site need to make certain that they obtain up-to-date information on the well and on the quality of the well water. This information may be provided through the local health department. In addition, if the property is to be developed for residential use in the future, lead sampling, in addition to the microbial analysis, should be a part of the well-development protocol.

Lead, a bluish-gray metal that occurs naturally in the environment, is found in small amounts in the earth's crust. Lead itself cannot be broken down, but lead compounds in water may combine with different chemicals depending on the acidity and temperature of the water (ATSDR 1999). The source of lead in this instance is still unknown, but it is not likely that the level found in the affected well is naturally occurring.

The highest concentration of lead detected in the groundwater in the residential well sampled was 0.144 ppm. That value exceeds EPA's action level of 0.015 ppm for lead in drinking water. We do not know for certain what environmental levels affect blood lead levels; however, we do know that blood lead levels previously considered safe are now considered hazardous, with no known threshold (ATSDR 1992). In order to evaluate the likelihood of adverse health effects in people who drink water contaminated with lead, we investigated studies of lead's health effects for this route of exposure. Based on mathematical factors, it was determined that people drinking water at lead levels greater than 0.05 ppm could absorb enough lead to experience long-term health consequences (ATSDR 1997).

There are varying effects of lead toxicity in adults. The most sensitive target of lead poisoning is the nervous system. Lead exposure had also been associated with hypertension, renal (kidney) disease, and reproductive and developmental effects in adults (ATSDR 1999; Needleman 1992).

If the residence in question becomes occupied in the future by a pregnant woman or someone who intends to become pregnant, it should be recognized that lead accumulates in bones and is released during pregnancy, causing the bone lead to move into the blood. The mobilization of lead can have an impact on the developing fetus (ATSDR 1997). These facts further emphasize the importance of maintaining the filter system currently in place in the residence.

Child Health Considerations

The Indiana State Department of Health and the Agency for Toxic Substances and Disease Registry recognize that there are unique vulnerabilities to be considered for chemical exposures in children, especially with lead contamination considering its toxic properties. However, there are no children living in the residence at the present time, and there is no indication that children are at risk in the vicinity of the residence because the levels of lead found at the neighboring properties are below levels that are likely to cause harmful effects. However, ISDH and ATSDR encourage no exposure to lead if possible. Future residential plans for development of the area that could result in new well installations in the contaminated aquifer are unknown.

Conclusions

1. People who live or have lived in the residence with the highest level of lead detected in the private well near the Brownsburg Conservation Club were exposed to lead at levels that posed a public health hazard. We do not have information about the residents' blood lead levels from the time they were using the contaminated well water. Therefore, we cannot know how the lead in the water affected them. Pregnant women who ingested the lead-contaminated water could expose their fetuses to lead.
2. ISDH has determined that no public health hazard currently exists for the residents of the home where lead was found in the well water. A filtration system has been installed in the home to remove the lead, and no one is ingesting contaminated water. This statement is based on information provided by IDEM from past conversations and the more recent phone conversation with the owner of the private well in July 2003.
3. Geological conditions specific to the site area are not defined, and the source of contamination has not been identified. Because of those issues, no one can predict whether existing private wells or new ones that might be developed are at risk of becoming contaminated at levels that pose a health threat.

Recommendations

Through the Hendricks County Health Department, a request for county planning personnel to perform lead sampling for all new homes within ½ mile of the contaminated well near the BCC will be carried out. This would be an extension of the health department's current requirements.

Public Health Action Plan

1. The Hendricks County Health Department will be responsible for informing well drillers and property owners (within ½ mile of the contaminated well) that lead needs to be tested at the same time new wells are tested for the health department's regular requirements. This information would be provided by the Hendricks County Area Planning Commission when it is known that a new house will be built in the area and a well is to be installed. The ISDH Environmental Laboratory has agreed to provide analysis of water samples from the wells without cost to the consumer if the samples are taken by and submitted through the local health department.
2. When ISDH is notified by the local health department that new wells are going into the area, they will provide the homeowner with information to enable them to make sound health choices with regards to exposure, health effects, and other related public health concerns pertaining to lead.

Preparer of Report

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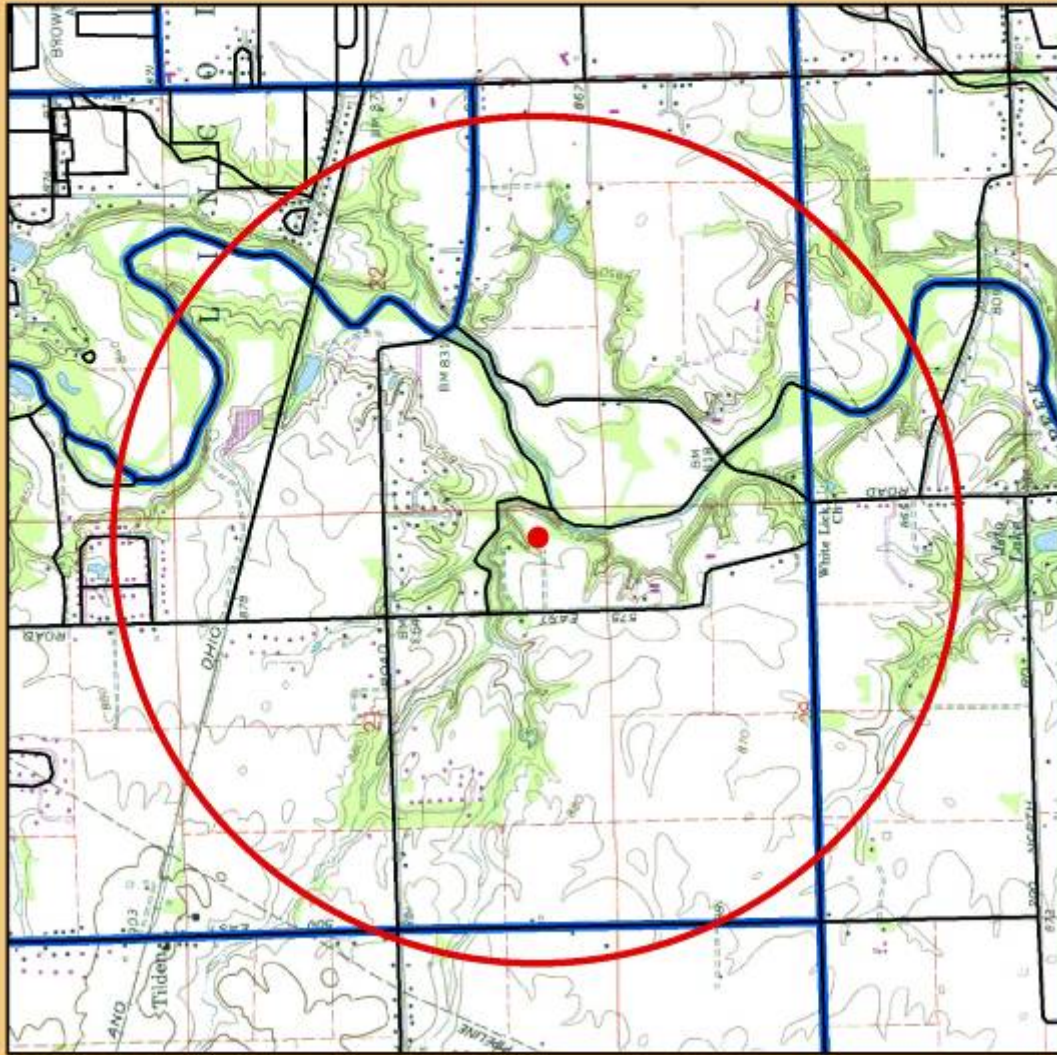
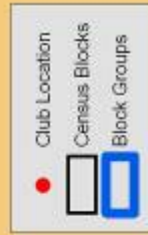
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Figures

Figure 1. General view of Brownsburg.

Figure 2. Site location and surrounding properties.

**FIGURE 1:
ONE MILE
RADIUS FROM
BROWNSBURG
CONSERVATION
CLUB**



 Indiana State
Department of Health

December, 2003

**FIGURE 2:
BROWNSBURG
CONSERVATION
CLUB AND
SURROUNDING
NEIGHBORHOOD**



- Well (Estimated Site)
- Structure
- Road
- Stream
- Intermittent Stream
- Pond
- Intermittent Pond

0 150 300 600
Feet



Indiana State
Department of Health

December, 2003

Certification

This Brownsburg Conservation Club Health Consultation was prepared by the Indiana State Health Department in cooperation with the Agency for Toxic Substances and Disease Registry. The health consultation is in accordance with guidelines and procedures present at the time the health consultation was begun.

Technical Project Officer
DHAC, SSAB, CAT

This health consultation has been reviewed by the Division of Health Assessment and Consultation, ATSDR. ATSDR concurs with the findings in the health consultation.

Chief, CAT, SSAB, DHAC, ATSDR