Health Consultation

LeRoy Community Unit School District No. 2

LeRoy, McLean County, Illinois

Prepared by:

The Illinois Department of Public Health
Under a cooperative agreement with the
Agency for Toxic Substances and Disease Registry

Purpose

The Illinois Department of Public Health (IDPH) prepared this health consultation under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). IDPH evaluated whether a public health hazard currently exists at the LeRoy School site in McLean County, Illinois. Our conclusions are based on available environmental data, site visits, and community health concerns.

Background and Statement of Issues

Site History

The LeRoy School site is an active school campus in the LeRoy Community Unit School District (CUSD) No. 2. It is located at 600 East Pine Street in LeRoy, McLean County, Illinois (Attachment 1). The campus, which has physically connected junior high and high school buildings, is bounded by Center Street (north), Lynn Street (east), Pine Street (south), and Mill Street (west). The site covers approximately 5 acres and comprises a city block that is also occupied by a single-family home in the northeast corner. Surrounding properties are predominately residential, with a park northwest and a museum west of the campus (1).

The city of LeRoy has a population of about 3,400 (2). Residents obtain water from four community wells located more than 0.4 miles northwest of the campus. These wells provide an average of 276,000 gallons of water per day to about 1,300 homes and businesses (3).

In 2001, HDC Engineering investigated a leaking underground storage tank (LUST) southeast of the former bus maintenance garage (Attachment 2). The environmental investigation was required before constructing a school addition at this location. Samples of soil and groundwater samples contained fuel and solvent contamination. Investigators believe that fuel contaminants were from a leaking underground storage tank that was removed in 1998 and that solvent contaminants were from solvents used over many years to clean and degrease equipment in the bus maintenance garage.

In July 2003, HDC Engineering began corrective actions under the Illinois Environmental Protection Agency's (Illinois EPA) LUST Program to address the contamination. HDC oversaw the demolition of the bus garage and a nearby shed. Debris disposal was completed in August 2003. Contaminated soil was excavated 11 feet deep and deposited in the Clinton Landfill as non-special waste. During excavation, air was monitored hourly for volatile organic chemicals (VOCs) at three different locations: two adjacent to the school and one on a neighboring residential property. Air sampling was part of the site safety plan to ensure that unacceptable levels of VOCs were not migrating to sensitive populations.

Post-cleanup soil and groundwater sampling was completed in October 2003. Sample analysis was limited to benzene, toluene, ethybenzene, and total xylene (BTEX) compounds commonly found in gasoline fuel. Because the cleanup focused on LUST Program requirements, only the solvent contaminants that commingled with BTEX were removed. The remaining solvents at the site have not been characterized, and Illinois EPA has not addressed the remaining contamination. Illinois EPA encouraged the city to apply for a municipal Brownfields

redevelopment grant. The grant could provide the school district with money for additional cleanup at the site.

Site Visit and Indoor Air Sampling

IDPH and HDC staff visited the LeRoy site in June 2003. On behalf of the school district, HDC requested that IDPH collect indoor air samples for VOC testing. HDC provided air sampling equipment and analytic services; IDPH collected air samples and interpreted the results.

Although school was not in session during the air sampling, custodians, clerical staff, plumbing contractors, teachers in training, and basketball clinic attendees were present. No one was permitted in classrooms where 8-hour air samples were collected. Air-sampling was designed to determine whether underground VOCs might be causing vapor intrusion into the school.

Discussion

Chemicals of Interest

IDPH compared the results of each environmental sample with the appropriate screening comparison values to select chemicals for further evaluation for cancer and non-cancer health effects (Attachment 3). Chemicals at levels exceeding comparison values or those for which no comparison values existed were selected for further evaluation. Designating a chemical as being "of interest" does not necessarily mean it will cause adverse health effects if exposure occurs.

VOC contamination including benzene and solvents was detected at levels exceeding drinking water comparison values (Tables 1, 2, and 3).

On-site Groundwater

In 2000, 2001, and 2003, 14 groundwater-monitoring wells were sampled (Attachment 2). Most of the wells are approximately 15 feet deep, except monitoring well (MW)-13, which is 25 feet deep (4). Analytic results from samples collected after remediation to determine the effectiveness of corrective action indicate that benzene contamination on the site remains higher than the maximum contaminant level (MCL) set by the U.S. Environmental Protection Agency (USEPA) for public drinking water supplies (Table 3). Shallow groundwater appears to flow across the site to the northwest and the southwest (5).

Off-site Groundwater

During the 2000 and 2001 sampling events, four groundwater-monitoring wells (MW-9, 11, 12, and 17) located across Pine and Center Streets were sampled (Attachment 2). MW-9, sampled in 2001, contained the solvent cis-1,2-dicholorethene at 7.53 parts per billion (ppb) (5). This contaminant is a breakdown product of tetrachloroethene (PCE), which was detected at much greater levels in on-site monitoring wells MW-2 and MW-3. Although the sample contained PCE, the level did not exceed the drinking water comparison value. No off-site groundwater monitoring wells were sampled after the 2003 site remediation, however, BTEX constituents may have migrated toward off-site wells MW-9 and MW-17, resulting in elevated levels of benzene detected during the 2003 sampling of nearby MW-2. IDPH has not identified private water wells near the site.

On-site Soil

Since 2000, several soil samples have been collected at depths from 3 to 24 feet below the ground surface (Attachment 2). Soil samples collected in 2003 after site remediation indicated benzene as the only BTEX constituent still detected at levels greater than Illinois EPA Tier 1 Soil Remediation Objectives (SRO) (1). Although contaminated soil remains on the site, it does not exceed ATSDR soil comparison values and does not appear to be near adjacent properties. Most contaminated soil was excavated 8 feet deep in the former bus maintenance area and soil immediately to its south and southwest. After soil excavation, no sampling was conducted for PCE or its breakdown products; however, previous soil sampling results did not show these contaminants at levels greater than ATSDR soil comparison values.

The school district proposed building a school addition on this area. The planned construction of buildings and pavement is expected to provide an engineered barrier to the contamination remaining on the site. The existing school building also will be used as an engineered barrier for contamination that has migrated beneath the concrete slab.

Indoor Air

HDC Engineering and IDPH collected indoor air samples from three classrooms in the summer of 2003 to determine whether underground BTEX or PCE and its breakdown products could be causing vapor intrusion into the school. The sampling did not detect any of these chemicals at levels greater than ATSDR air comparison values (6). At the time of the air sampling activities, IDPH found no apparent vapor intrusion of these contaminants into the school.

Exposure Assessment

On-site well water samples from 2000, 2001, and 2003, revealed benzene and chlorinated solvent levels greater than comparison values (Tables 1–3). No private groundwater wells have been identified on or adjacent to the school site.

The potential for exposed persons to experience adverse health effects depends on several factors, including

- how much of each chemical to which a person is exposed,
- how long a person is exposed, and
- the health condition of the exposed person.

Because LeRoy provides municipal water to all residents, no one should be using the shallow, contaminated groundwater on the site. This eliminates the potential for exposure to contaminated groundwater.

Although vapor intrusion is a potential pathway at the site, limited indoor air sampling in the summer of 2003 did not show elevated VOC levels in indoor air. This does not, therefore, appear to be a completed exposure pathway.

Child Health Considerations

Because children are a sensitive subpopulation for exposure to chemical contaminants, IDPH considered children when evaluating this site. Current conditions indicate that children would not be exposed to chemicals from this site.

Conclusions

From the information reviewed, IDPH concludes that current conditions at the LeRoy School site pose no apparent public health hazard. Although groundwater and soil contamination remain on the site, a municipal water supply and proposed engineering controls should eliminate the potential for exposure to site contaminants.

Recommendations

IDPH recommends that

1. Illinois EPA continue monitoring groundwater at the site.
2. Illinois EPA should ensure that a water well survey be performed to identify any private wells in the immediate area of the site.
3. The school inform either Illinois EPA or IDPH of any unusual petroleum-related odors.

Author

Cary Ware

Environmental Health Specialist
Illinois Department of Public Health

References

1. HDC Engineering, Incorporated. Underground storage tank program correction action status report for LeRoy School District No. 2. Champaign, Illinois. Illinois Environmental Protection Agency; Nov 2003.
2. City of LeRoy, Illinois. Welcome to LeRoy, Illinois Web site. Available at: http://www.leroy.org/. Accessed July 21, 2004.
3. Illinois Environmental Protection Agency. Source water assessment program fact sheet for LeRoy. Springfield, Illinois. September 2001.
4. HDC Engineering, Incorporated. Groundwater and soil sampling results. Champaign, Illinois. Illinois Environmental Protection Agency; October and November 2001.
5. HDC Engineering, Incorporated. Soil boring and groundwater elevation data for the LeRoy School District No. 2. Champaign, Illinois. Illinois Environmental Protection Agency; March 2003.
6. HDC Engineering, Incorporated. Indoor air sample results. Champaign, Illinois. Illinois Environmental Protection Agency; June 2003.

CERTIFICATION

The Illinois Department of Public Health, under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), prepared this LeRoy, Illinois School District consultation. It was prepared in accordance with approved methodology and procedures existing at the time.

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Allen Robison

Technical Project Officer
Superfund and Program Assessment Branch
Division of Health Assessment and Consultation, ATSDR

The Division of Health Assessment and Consultation has reviewed this health consultation and concurs with its findings.

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Bobbi Erlwein

Team Leader, Cooperative Agreement Team
Superfund and Program Assessment Branch
Division of Health Assessment and Consultation, ATSDR

Table 1. Chemicals of interest found (ppb*) in on-site groundwater monitoring wells (MW) in LeRoy, Illinois, March 2000.

Chemicals	Comparison Values (MCLs*)	MW2	MW3	MW4	MW5
Vinyl chloride	2 ppb	2,910	U*	U	U
Trichloroethene	5 ppb	1,588	2,170	70	14
trans-1,2-Dichloroethene	100 ppb	2,950	U	U	13
Tetrachloroethene	5 ppb	7,430	31,400	308	9
cis-1,2-Dichloroethene	70 ppb	1,890	341	308	605
Benzene	5 ppb	52	U	U	46
1,1-Dichloroethene	7 ppb	1,850	U	U	14

*ppb – parts per billion; MCLs – maximum contaminant levels; U – not detected

Table 2. Chemicals of interest found (ppb*) in on-site groundwater monitoring wells (MW) in LeRoy, Illinois, November 2001.

Chemicals	Comparison Values (MCLs*)	MW2	MW3	MW4	MW5	MW6	MW7	MW8	MW16	MW18
Vinyl chloride	2 ppb	U*	U	U	5.77	655	U	18.2	U	U
Trichloroethene	5 ppb	U	1,020	42.2	U	U	U	55.4	U	U
Tetrachloroethene	5 ppb	3,540	14,700	215	U	U	15.3	117	U	U
cis-1,2-Dichloroethene	70 ppb	78,500	134	169	198	25.3	28.3	409	2.43	1,670
Benzene	5 ppb	U	U	U	34.8	U	U	U	U	U

***ppb – parts per billion; MCLs – maximum contaminant levels; U – not detected**

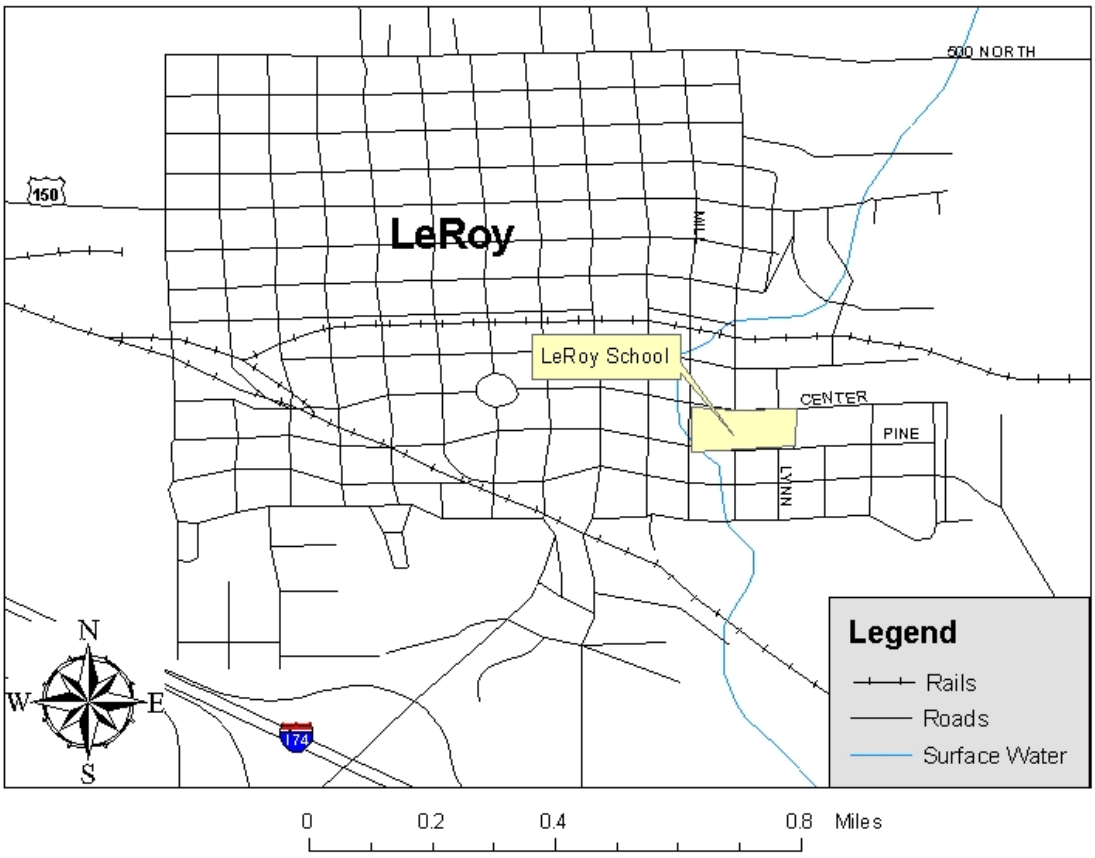
Table 3. Chemical of interest found (ppb*) in on-site groundwater monitoring wells (MW) in LeRoy, Illinois, October 2003.

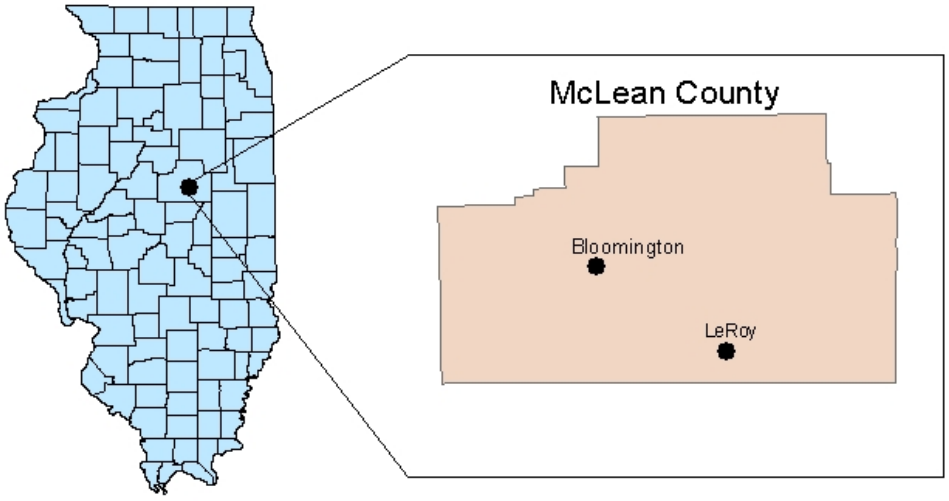
Chemical	Comparison Value (MCL*)	MW2	MW5A	MW8
Benzene	5 ppb	45.9	43.4	5.65

*ppb – parts per billion; MCLs – maximum contaminant levels; U – not detected

Attachment 1

Approximate Location of LeRoy School Site

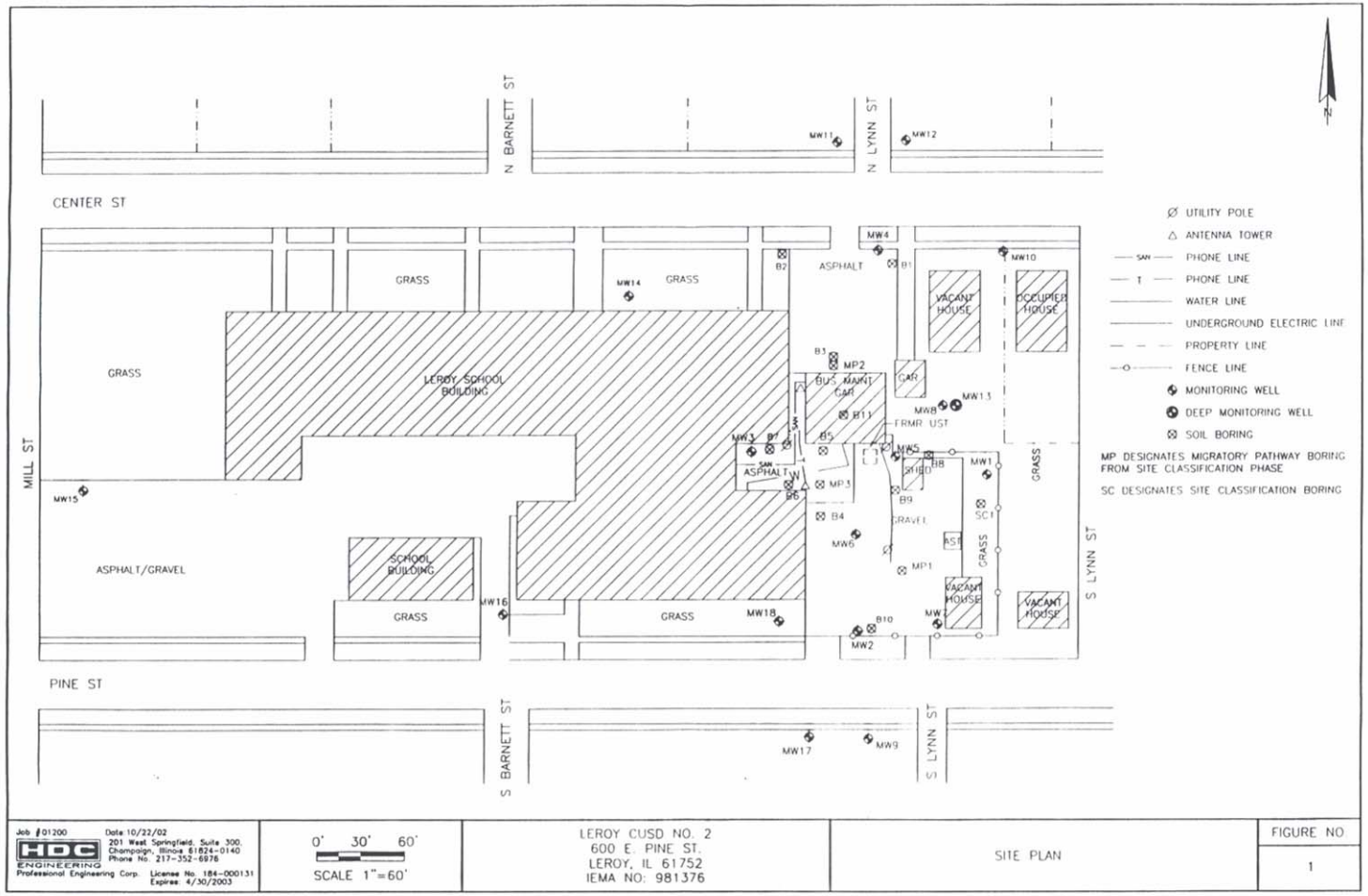




Source: IDPH GIS

SAMPLE LOCATIONS

Attachment 2



Job #01200 Date 10/22/02 HDC ENGINEERING Professional Engineering Corp. License No. 184-000131 Expires 4/30/2003 201 West Springfield, Suite 300, Champaign, Illinois 61824-0140 Phone No. 217-352-6978	0' 30' 60' SCALE 1"=60'	LEROY CUSD NO. 2 600 E. PINE ST. LEROY, IL 61752 IEMA NO: 981376	SITE PLAN	FIGURE NO. 1

Attachment 3: Comparison Values Used in Screening Contaminants for Further Evaluation

Comparison values (CVs) are the calculated levels of a chemical in air, water, food, or soil that are unlikely to cause adverse health effects in exposed persons. CVs are used as a screening level during the public health assessment process. Substances found in amounts greater than their CVs might be selected for further evaluation in the public health assessment process.

The assessment process uses three different types of comparison values: environmental media evaluation guides (EMEGs), reference dose media evaluation guides (RMEGs), and cancer risk evaluation guides (CREGs). These values are used to screen chemicals and determine those that need to be evaluated further.

Environmental media evaluation guides (EMEGs) are derived from minimal risk levels presented in ATSDR Toxicological Profiles. Standard exposure assumptions for children and adults (e.g., body weights; ingestion rates for water, soil and air; and frequency and duration of exposure) are used. Individual EMEGs do not consider cancer, chemical interactions or multiple routes of exposure. They do help to identify specific chemicals needing further evaluation.

Reference dose media evaluation guides (RMEGs) are derived from the oral RfDs developed by USEPA using standard exposure assumptions for children and adults (body weights; ingestion rates for water, soil and air; and frequency/duration of exposure). Like EMEGs, RMEGs do not consider carcinogenic effects, chemical interactions, or multiple exposures.

Cancer risk evaluation guides (CREGs) represent levels of environmental chemicals that could pose a $1x10^{-6}$ (one in a million) excess cancer risk. They are derived using cancer slope factors published by USEPA.