Health Consultation

September 1998 Residential Well Sampling Results

INDUSTRIAL EXCESS LANDFILL

UNIONTOWN, STARK COUNTY, OHIO

CERCLIS NO. OHD000377911

MARCH 26, 1999

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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Prepared by:

Bureau of Environmental Health & Toxicology
Ohio Department of Health
Under Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

STATEMENT OF ISSUES

In February 1999, the Health Assessment Section (HAS) of the Ohio Department of Health was asked by the Agency for Toxic Substances and Disease Registry (ATSDR) to evaluate the results of sampling of six residential wells in the vicinity of the Industrial Excess Landfill Superfund Site carried out by the United States Environmental Protection Agency (US EPA) Region V Office in September 1998. Specifically, HAS was asked to review the well sampling results received from US EPA and to determine if samples contained contaminants that could pose any public health hazards.

BACKGROUND

The Industrial Excess Landfill Superfund site (IEL) is on the eastern edge of Uniontown in a mixed residential and commercial portion of Lake Township in northwestern Stark County, Ohio. The 30-acre site is bounded by what formerly was a mixed residential/commercial area along Cleveland Avenue to the west, by residential areas to the north, by Metzger's Ditch and agricultural land to the east, and by agricultural land on the south (Figure 1).

IEL was the site of a sand and gravel quarry until 1966. The site was converted to a landfill that received a variety of municipal, commercial, and industrial wastes until it was closed in 1980. Wastes were landfilled to depths of 45 feet below the surface (PRC Environmental, 1992). Following closure, the site was graded to promote run-off to Metzgers Ditch, sloping from an elevation of 1,180 feet at the northwest corner to an elevation of 1,120 feet to the southeast (Bair and Norris, 1989). The surface of the site was covered with "clayey overburden" and then seeded (ATSDR, 1989). A landfill gas abatement system was installed at IEL between 1985 and 1987 to contain and reduce high concentrations of methane produced by the decomposition of municipal wastes. An estimated 780,000 tons of waste was disposed at the site, including significant quantities of industrial and chemical wastes from the rubber industry in nearby Akron (ATSDR, 1989). The landfill was placed on the National Priorities List (NPL) of Superfund hazardous waste sites in 1984, primarily because of concerns about the potential for the off-site migration of hazardous substances from IEL into adjacent residential areas through groundwater and landfill gases.

IEL is situated in an area of irregularly-shaped knolls, hills, and intervening, poorly-drained depressions. Most of the immediate area surrounding the site is underlain by sand and gravel deposits 50 to 100 feet thick. These deposits are water-bearing, and wells drilled into these sands and gravels provide drinking water to area residences and businesses (Bair and Norris, 1989). These glacial sand and gravel deposits are, in turn, underlain by sandstone and shale bedrock that also may be water-bearing. Prior to 1990, most of the adjacent residential areas obtained their drinking water from individual private wells. Wells in the vicinity of IEL are typically drilled to depths of less than 100 feet below the ground surface into the glacial sand and gravel aquifer or at the interface between the glacial cover and the underlying bedrock (Dumouchelle and Bair, 1994). Since 1990, residential neighborhoods in the immediate vicinity of IEL have used the North Canton municipal water supply (Figure 1). Information is not

available on how many area residents are still using private wells for their drinking water supply.

Groundwater Flow at IEL Site

Landfilled wastes at IEL appear to be separated from the water table by 1 to 15 feet of glacial soil, and some debate exists as to whether wastes are in direct contact with groundwater anywhere at the site (US EPA, 1995). Historical sampling of on-site monitoring wells drilled into the glacial deposits underlying the IEL site indicates that groundwater under the site is contaminated with low-levels of man-made organic chemicals and elevated levels of some heavy metals. Groundwater flow in the vicinity of IEL is influenced by the porosity and permeability of the underlying glacial deposits, local surface topography, and the nature of the underlying bedrock surface.

Investigations of the geology in the vicinity of IEL indicate that the underlying porous and permeable sand and gravel deposits are locally disrupted by discontinuous, low-permeability clay layers at depths of roughly 65 and 100 feet below the ground surface (Bair and Norris, 1989). The underlying bedrock surface in the area is also irregular, sloping down toward a buried bedrock valley west-northwest of the site and sloping up toward bedrock hills to the north, east, and southeast of the site (ATSDR, 1995). Studies by the U.S. Geological Survey (Dumouchelle and Bair, 1994) indicate that groundwater flow in the glacial sand and gravel aquifer at IEL is roughly radial off the IEL site, flowing west, east, and southeast. Groundwater flowing northwest and north of the site is obstructed by a groundwater "mound" that prevents groundwater flow from IEL to the north, deflecting it east and west.

Residential Well Sampling

Residential wells in the vicinity of IEL have been sampled on a number of occasions by various agencies involved in the investigation of the IEL site. Data available to HAS indicates nine residential wells were sampled in February 1988; August and December 1990; December 1991; May, August, and December 1992; and March 1993. The results of these historical sampling events were reviewed and evaluated by ATSDR in a previous health consultation addressing groundwater contaminant concerns associated with the IEL site (ATSDR, 1995). ATSDR concluded that "people near the landfill are unlikely to be exposed to landfill contaminants (at levels of health concern) through private well use."

US EPA and the Potential Responsible Parties (PRPs) carried out another groundwater sampling round in September 1998. That sampling included 23 on-site and off-site monitoring wells. In addition, US EPA sampled six residential wells north and west of IEL. The US EPA sampling results for the six residential wells are evaluated in this document.

DISCUSSION OF THE ISSUES

US EPA sampled water from the wells of six area homes that were not connected to the municipal water system in September 1998. Only one of those wells (RW70) had been previously sampled (December 10, 1991; December 2, 1992; March 5, 1993). Two wells are within ¼ mile north of IEL, and the other four wells are within ½ mile west of the site (Figure 1). Well construction data were available only for RW101, which has a depth of 86 feet and penetrates the glacial sand and gravel aquifer. The depths and source of the water in the remaining wells are unknown. However, residential well information provided by Dumouchelle and Bair (1994) suggests that all of the wells sampled are likely to obtain their water from the glacial aquifer. On the bases of inferred groundwater flow conditions at the IEL site (Dumouchelle and Bair, 1994), residential wells RW28 and RW 101 are upgradient of IEL, and wells RW70, RW102, RW103, and RW104 are likely downgradient from the site.

The results of the September 1998 well sampling indicates that none of the residential wells sampled are being impacted by contaminants from the IEL site, and all detections in these wells are below levels of the public drinking water standards, Maximum Contaminant Level (MCLs) (Table 1). Metal levels in downgradient residential wells sampled were no different than those concentrations found in upgradient wells. The laboratory detection limits used for analyses of these residential wells are low enough to fully evaluate the health implications of the results.

Toluene

Estimated trace levels of toluene (0.6 to 0.9 parts per billion) were found in five of the six residential well water samples. However, the laboratory trip blank contained the same level of toluene (0.7 ppb). That indicates the toluene is likely the result of laboratory contamination and not present in the actual water supply. All the levels are below the MCL and below ATSDR's drinking water comparison value for toluene (Table 1).

Arsenic

Arsenic may be present as a naturally-occurring trace element in groundwater in Ohio because of the presence of reducing (oxygen-poor) conditions (Bendula, 1996). Arsenic was detected in four out of 6 residential wells in the vicinity of IEL. Three wells have levels of 2 ppb, and one contains arsenic at 5 ppb. Those levels are typical of naturally-occurring background conditions and are below the MCL (Table 1). Because the level is above ATSDR's comparison value, HAS looked further at the exposure. The No-Observed-Adverse-Effect-Level (NOAEL) for arsenic through drinking water is 0.0008 mg/kg/day, which is based on a large study for a population of 17,000 people. The exposure period upon which this NOAEL was based was 45 years or longer (ATSDR, 1998). This NOAEL level corresponds to a level of 28 ppb in drinking water. Therefore, no adverse health effects are expected as a result of exposure to the arsenic.

Barium

Barium often forms compounds that are soluble in groundwater. Barium is a common trace element in groundwater in the state. Levels detected in the residential wells sampled were below the MCL and below the ATSDR comparison value (Table 1). Barium concentrations in

residential wells adjacent to IEL are similar to those detected in residential wells drilled into similar glacial sand and gravel aquifers in adjacent portions of Summit and Portage counties, and approximate background levels.

Iron and Manganese

These metals are soluble in groundwater and are common, naturally-occurring trace elements found in groundwater across Ohio. The concentrations of these chemicals are controlled by local and regional geochemical conditions. Elevated levels of iron and manganese are common to both glacial and bedrock aquifers in northeastern Ohio. Iron and manganese levels exceed U.S. EPA Secondary MCLs, which are based on water quality (odor, taste, and color) rather than health-based standards. Installation of cation-exchange water softener units will eliminate most of the detrimental effects of these metals in well water.

Cadmium, Chromium, Lead, Nickel

Those metals were not found in the residential wells sampled by U.S. EPA in September 1998.

CONCLUSION

The results of the September 1998, U.S. EPA sampling of six residential wells north and west of the IEL site indicate that all detections of metals and volatile organic compounds in these wells are below levels of public health concern.

RECOMMENDATION

Residents who live downgradient, in the immediate vicinity of IEL, who still use private well water for their drinking water should be identified and have their wells monitored for site-related volatile organic compounds and metals.

REFERENCES

AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY (ATSDR). 1989. Health Assessment for the Industrial Excess Landfill, Uniontown, Ohio. July 21, 1989. 37 p.

ATSDR. 1995. Public Health Consultation for Groundwater at the Industrial Excess Landfill, Uniontown, Ohio. August 21, 1995. 10 p + figures and tables.

ATSDR. 1998. Toxicological Profile for Arsenic. U.S. Department of Health and Human Services. 349 p.

BAIR, E. S., and S. E. NORRIS. 1989. Ground-water levels and flow near the Industrial Excess Landfill, Uniontown, Ohio. U. S. Geological Survey Open-File Report 89-272. 11 p.

BENDULA, R. 1996. Arsenic in Bedrock Wells. Ohio Environmental Protection Agency Inter-Office Correspondence, March 4, 1996. 8 p.

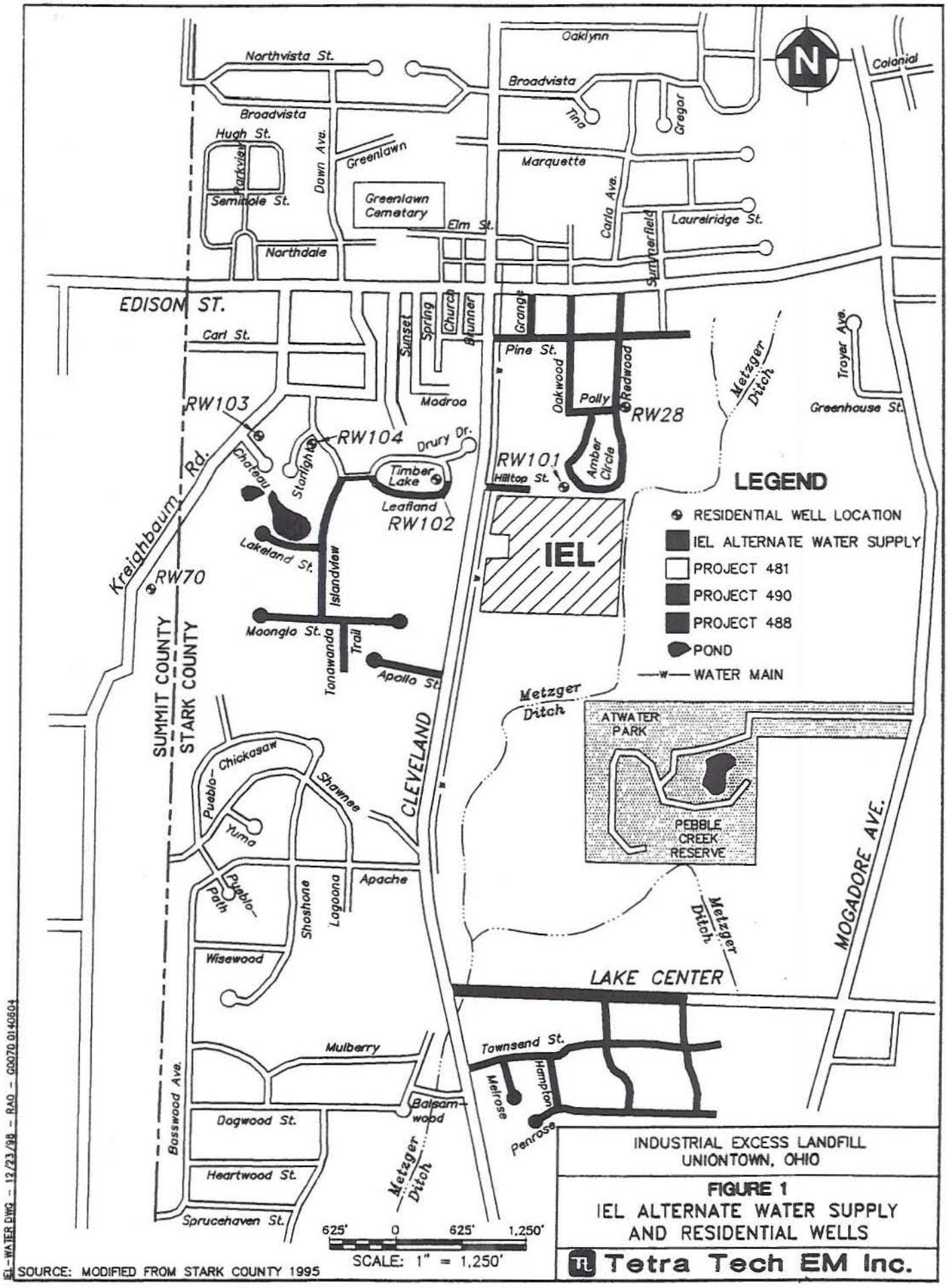
DUMOUCHELLE, D. H., and E. S. BAIR. 1994. Ground-water Levels and Directions of Flow near the Industrial Excess Landfill, Uniontown, Ohio, March 1994. Water Resources Investigations Report 94-4136. 36 p.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (US EPA). 1995. US EPA Response to the Position Paper and Comments submitted by the Rubber Companies on the 60% Remedial Design Report and Related Documents, Industrial Excess Site, Uniontown, Ohio. July, 1995. 30 p. + Appendices.

TABLE 1
Analytical results (ppb) of U.S. EPA sampling of Residential Wells in the vicinity of IEL, Uniontown (September, 1998)

Chemical	RW28	RW101	RW70	RW102	RW103	RW104	ATSDR Comparison Value (ppb)	US EPA MCL (ppb)
Toluene	0.7J*	0.9J	0.6J	ND	0.7J	0.9J	200/EMEG	1,000
Arsenic	2	2	ND	5	2	ND	0.02/CREG	50
Barium	187	290	320	156	263	ND	700/RMEG	2,000
Cadmium	ND	ND	ND	ND	ND	ND	2/EMEG	5
Chromium	ND	ND	ND	ND	ND	ND	30/RMEG	100
Iron	3,560	1,280	803	897	3,780	ND	NA	300**
Lead	ND	ND	ND	ND	ND	ND	NA	15
Manganese	219	162	58	42	146	ND	50/RMEG	50**
Nickel	ND	ND	ND	ND	ND	ND	100/LTHA	100

MCL = U.S. EPA Maximum Contaminant Level for public drinking water supplies
ppb = Part Per Billion
* =J is an estimated value
** = U.S. EPA Secondary MCL (aesthetic rather health-related standard)
ND =Chemical not detected
EMEG =Environmental Media Evaluation Guide
CREG =Cancer Risk Evaluation Gide for $1x10^{-6}$ excess cancer risk
RMEG =Reference Dose Media Evaluation Guide
NA =None Available
LTHA =Lifetime Health Advisory for Drinking Water (EPA)


Northvista St.
Broadvista
Hugh St.
Parkview
Dawn Ave.
Greenlawn
Seminole St.
Greenlawn Cemetary
Elm St.
Northdale
Oaklynn
Broadvista
Tina
Gregor
Marquette
Carla Ave.
Summerfield
Laurelridge St.
Colonial
N
EDISON ST.
Carl St.
Sunset
Spring
Church
Brunner
Grange
Pine St.
Oakwood
Polly
Redwood
RW28
Metzger Ditch
Troyer Ave.
Greenhouse St.
Madroo
RW103
RW104
Drury Dr.
Chateau
Starlight
Timber Lake
Leafland
RW102
RW101
Hilltop St.
Amber Circle
Kreighbaum Rd.
RW70
Lakeland St.
Islandview
Moongio St.
Tonawanda Trail
Apollo St.
IEL
LEGEND
RESIDENTIAL WELL LOCATION
IEL ALTERNATE WATER SUPPLY
PROJECT 481
PROJECT 490
PROJECT 488
POND
WATER MAIN
SUMMIT COUNTY
STARK COUNTY
Metzger Ditch
ATWATER PARK
PEBBLE CREEK RESERVE
Pueblo-Chickasaw
Shawnee
CLEVELAND
Yuma
Pueblo Path
Shoshone
Lagoona
Apache
MOGADORE AVE.
Wisewood
LAKE CENTER
Mulberry
Townsend St.
Hampton
Melrose
Penrose
Basswood Ave.
Balsamwood
Dogwood St.
Heartwood St.
Sprucehaven St.
625' 0 625' 1,250'
SCALE: 1" = 1,250'
SOURCE: MODIFIED FROM STARK COUNTY 1995
INDUSTRIAL EXCESS LANDFILL
UNIONTOWN, OHIO
FIGURE 1
IEL ALTERNATE WATER SUPPLY
AND RESIDENTIAL WELLS
Tetra Tech EM Inc.
IEL-WATER.DWG - 12/23/98 - RAO - G0070.0140604

CERTIFICATION

This Industrial Excess Landfill Site Health Consultation was prepared by the Ohio Department of Health under 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

Technical Project Officer, SPS, SSAB, DHAC

The Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this health consultation and concurs with its findings.

Chief, SPS, SSAB, DHAC