

Health Consultation

MATCHBOX DAYCARE AND ADJOINING FACILITIES
VAPOR INTRUSION OF TRICHLOROETHYLENE

CITY OF WARSAW, KOSCIUSKO COUNTY, INDIANA

MARCH 15, 2005

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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VAPOR INTRUSION OF TRICHLOROETHYLENE

CITY OF WARSAW, KOSCIUSKO COUNTY, INDIANA

Prepared by:

Indiana State Department of Health
Under Cooperative Agreement with the
U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry

The conclusions and recommendations in this health consultation are based on the data and information made available to the Indiana State Department of Health. The Indiana Department of Health and the Agency for Toxic Substances and Disease Registry will review additional information if received.

BACKGROUND AND STATEMENT OF ISSUE

The Indiana State Department of Health (ISDH) was asked by the Indiana Department of Environmental Management (IDEM) to evaluate the public health implications of trichloroethylene (TCE) off gassing from contaminated soil and migrating into buildings in a residential/commercial neighborhood of Warsaw, Indiana. In particular, there was concern for potential health effects for pre-school children who attended the Matchbox daycare facility. The daycare is located in a large one room building which also houses a church. This facility is located on part of a larger property which was formerly the local gas utility manufacturing plant.

The former manufactured gas plant (MGP) was owned and operated by the Northern Indiana Public Service Company (NIPSCO). NIPSCO conducted sampling to assess contamination at its former MGP locations. Indoor air sampling was conducted at the Warsaw location in April 2003. Volatile organic compounds (VOCs) were detected at the day care. Trichloroethylene (TCE) was found in the highest concentration, but other VOCs including 1, 2-dichloroethene (1, 2-DCE) and 1, 1-dichloroethene (1, 1-DCE) were also found in indoor air. Data is summarized in Appendix A.

Both NIPSCO and IDEM evaluated the data. A map of the area (RETEC, 2004), with sample locations shown, is included here as Appendix B.

Historically, the entire property (a total of 4.0 acres) was built sometime around 1882. Before becoming a MGP, part of the site was the town cemetery until 1874. The building in question (16,000 square feet) has been added on and portions removed over the years.

The main portion of the site building was rented to a print shop for approximately 20 years, beginning around 1980. The building to the south was known as the "Monsanto" building. Site use after the MGP and before the printer is unknown. Recent groundwater data indicates an upgradient source for the TCE contamination.

Railroad tracks are found to the west of the site, next to single family residences. Commercial/industrial properties are located to the north, south and east. There are additional residences to the south beyond the commercial/industrial properties.

The site address is 502 E. Winona Avenue, Warsaw, IN 46580, Kosciusko County. Matchbox began operations as a church/daycare at this location August 2, 2002. After learning of the presence of organic contaminants in the indoor air, the daycare relocated on January 16, 2004. The church also ceased operations at this location.

The ages of the children attending Matchbox daycare range from 2 months to 11 years old. Lengths of time that the children have been attending the daycare vary from one day to approximately 1 ½ years.

Although VOCs have contaminated groundwater at the Matchbox facility, groundwater use is not currently a health issue of concern for the site. The facility and local residents use public utility water for consumptive purposes, so there is no completed pathway for exposure to VOCs from drinking or other domestic water uses. The primary exposure pathway of interest is via inhalation of soil gas vapors.

Site visit & community concerns

On January 23, 2004, representatives from IDEM, RETEC (NIPSCO's Contractor), and the Kosciusko County Health Department visited the area adjacent to Matchbox. The purpose of this visit was to inform public health officials of the goals of this Health Consultation, and to discuss any relevant community concerns. ISDH and the local health department are not aware of any specific community concerns at this time. Nonetheless, the daycare owner and church operator were provided with site and chemical fact sheets to broaden their knowledge about the site and potential chemicals of concern.

DISCUSSION

Environmental data and results

At each sampling location, soil gas samples were collected using a SUMMA canister (24 hour) and analyzed for VOCs in the laboratory using a gas chromatograph mass spectrometer (GC/MS).

ISDH uses ATSDR comparison values (CVs) when applicable to evaluate the public health implications of environmental contamination. Comparison values are media-specific concentrations that are used by health assessors to select environmental contaminants for further evaluation. Where available, all samples results were compared to the values for three periods of exposure:

1. acute (less than 15 days)
2. intermediate (15 – 364 days), and
3. chronic (365 days or more)

Appendix A shows the comparison values and summarizes the average results for indoor air sampling at the property for April and September of 2003 (IDEM, RETEC, 2004). Because of the limited data available, contaminants detected below comparison values are also included.

Human data that demonstrates any cancer effects from inhalation of VOCs at levels detected at the daycare were unavailable. Levels of exposure associated with carcinogenic effects (cancer effect levels) as indicated in available literature do not demonstrate any measurable effects at the part per billion (ppb) level (ATSDR). Additionally, the limited duration of exposure would not be likely to have a long term cancer effect.

The data summarized in this Health Consultation suggests that none of the concentrations of volatile organic compounds were found in excess of health-protective comparison values in the areas where the day care was operating. While there was a completed pathway with the inhalation of the various VOCs, to the children, workers and churchgoers, the inhalation of these compounds does not appear to present any health concern. Assuming that the available data is representative of levels found over the 2 years that the day care operated, exposure to the levels of VOCs found in indoor air pose no apparent public health hazard.

Child Considerations

Both ISDH and ATSDR recognize that children are a special population, in that their exposures to chemical are different from that of adults. Children are lower to the ground and breathe in more air space than adults and generally have a larger body burden to chemical exposures. In spite of this, it does not appear that any long term health concerns will be realized due to the past inhalation exposures at the Matchbox daycare facility.

CONCLUSIONS

Based on the limited, actual indoor air data at the daycare/church, ISDH has determined that indoor air concentrations did not exceed acute, intermediate or chronic comparison values for any of the contaminants evaluated for this consultation and posed no apparent public health hazard at the Matchbox daycare, or for the adjoining church. Neither the daycare nor the church are using the location so there is no public health hazard for the future.

RECOMMENDATIONS

ISDH has no further recommendations at this time.

PUBLIC HEALTH ACTION PLAN

1. ISDH has provided the citizens of the area appropriate chemical facts sheets (in English and Spanish) and will continue provide input to IDEM on any future follow-up activities when needed.
2. ISDH will work with the Kosciusko County Health Department in responding to public health concerns and questions when requested.

REFERENCES

Agency for Toxic Substances and Disease Registry. Public health assessment guidance manual. Atlanta: US Department of Health and Human Services; 1992

Indiana Department of Environmental Management. Data sheets concerning Matchbox daycare site. Warsaw, Indiana. 2003, 2004

RETEC. Diagram of former Manufactured Gas Plant after conversion to daycare/church, city, state, January 2004

PREPARER OF HEALTH CONSULTATION

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CERTIFICATION

This Matchbox Day Care, Warsaw, Indiana Public Health Consultation was prepared by the Indiana State Department of Health under a cooperative agreement with the federal Agency for Toxic Substances and Disease Registry (ATSDR). It was completed in accordance with approved methodologies and procedures existing at the time the health consultation was initiated. Editorial review was completed by the Cooperative Agreement partner.

Technical Project Officer, DHAC

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

Roberta Erlwein
Team Lead, CAT, SPAB, DHAC, ATSDR

**Appendix A: Summary of Indoor Air Average Sampling for Matchbox
Daycare/Adjoining Church**

**Table 1. Facility Building Former Warsaw MGP Site
Averaged Values April 2003 and September 2003 Events
(Parts per Billion)**

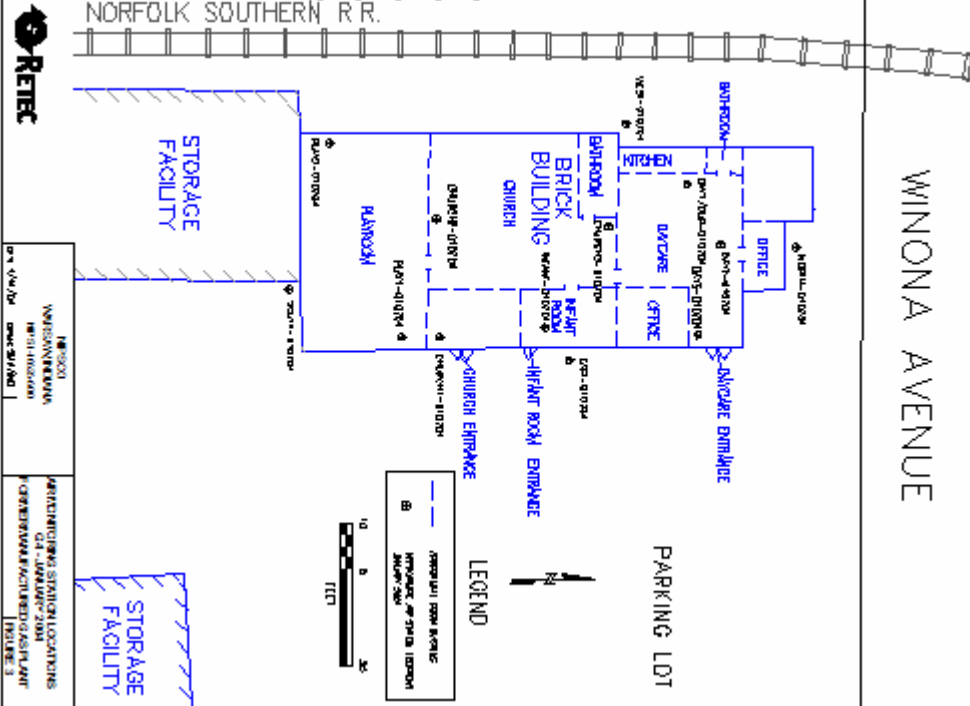
Contaminant	Day Care Area	Infant Room	Church Area	Playroom Area	Overall Facility	ATSDR Minimal Risk Levels ***
Benzene	0.48	0.49	0.43	0.51	0.48	50
Toluene	1.68	1.70	1.29	1.42	1.49	1000
Ethylbenzene	0.33	0.50	0.35	0.27	0.32	1000
Xylenes	1.64	4.04	1.61	1.35	1.82	1000
Naphthalene	0.28	0.35	0.24	0.25	<0.5	2
Acetone	26.43	10.95	13.06	9.43	15.84	2.6x10 ⁴
Dichlorodifluoromethane	0.84	0.93	0.96	1.17	0.98	
Chloromethane	0.72	0.61	0.62	0.57	0.64	500
1,1-Dichloroethane	0.87	1.10	1.61	1.75	1.40	
cis-1,2-Dichloroethene	6.62	7.50	10.64	12.46	9.80	
1,1,1-Trichloroethane	5.43	5.55	8.37	9.03	7.54	2000
Trichloroethene	7.03	7.25	10.53	11.85	9.72	2000
Tetrachloroethene	1.78	1.55	2.65	3.39	2.59	200
Methylene chloride	<0.9	<0.9	<0.9	<0.9	<0.9	600
trans-1,2-Dichloroethene	0.25	0.25	0.38	0.44	0.32	200
Trichlorofluoromethane ¹	0.30	0.29	0.31	0.35	0.31	
1,1,2-Trichloro-1,2,2-trifluoroethane ¹	0.17	<0.36	0.13	0.12	0.14	
2-Butanone ¹	1.13	0.63	0.73	0.80	0.86	
Chloroform ¹	0.20	0.12	0.13	0.12	0.13	100
Carbon Tetrachloride ¹	0.17	0.14	0.14	0.14	0.15	200
1,3,5-Trimethylbenzene ¹	0.20	0.51	<0.35	0.14	0.21	
1,2,4-Trimethylbenzene ¹	0.28	1.73	0.24	0.29	0.41	

***These values reflect acute inhalation exposures. Where available intermediate and chronic exposure comparison values were also evaluated and found to be higher than values detected in the areas tested.

Blank spaces indicate no value was available.

¹ Contaminant not detected in April sampling

**Appendix B: DIAGRAM OF THE MATCHBOX FACILITY AND
ADJACENT CHURCH**



WINONA AVENUE

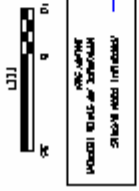
NORFOLK SOUTHERN R.R.



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1625 UNIVERSITY AVENUE
WINONA, MN 55093-2040
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ARCHITECTURAL STATION LOCATIONS
01 - JANUARY 2008
02 - FEBRUARY 2008
03 - MARCH 2008
04 - APRIL 2008
05 - MAY 2008
06 - JUNE 2008
07 - JULY 2008
08 - AUGUST 2008
09 - SEPTEMBER 2008
10 - OCTOBER 2008
11 - NOVEMBER 2008
12 - DECEMBER 2008

LEGEND



PARKING LOT

STORAGE FACILITY

STORAGE FACILITY

BRICK BUILDING

CHURCH

CHURCH ENTRANCE

INFANT ROOM ENTRANCE

CHURCH ENTRANCE

OFFICE

OFFICE

OFFICE

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